

15 OCTOBER 2003



*Flying Operations*

**AIR OPERATIONS RULES AND PROCEDURES**

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OPR: HQ ACC/DOTW (Maj Ronald P. Morrell)

Certified by: HQ USAF/XOO  
(Maj Gen Richard A. Mentemeyer)

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This instruction implements AFPD 11-2, *Aircraft Rules and Procedures*, and provides rules and procedures for Air-to-Air and Air-to-Surface operations and training. It applies to aircrews, Air Battle Manager (ABM)/Weapons Director (WD), Terminal Attack Controllers (TACs), and Remotely Operated Aircraft (ROAs) tasked with the tactical missions listed in AFDD1, Air Force Basic Doctrine. It applies to the following MAJCOMs: Air Combat Comm and (ACC), Air Education and Training Command (AETC), Air Force Special Operations Command (AFSOC), Air Mobility Command (AMC), Air National Guard (ANG), Air Force Reserve Command (AFRC), Pacific Air Forces (PACAF), and United States Air Forces in Europe (USAFE). Send comments and suggested improvements electronically on AF Form 847, **Recommendation for Change of Publication**, through channels, to HQ ACC/DOTW, 205 Dodd Blvd. Suite 101, Langley AFB VA 23665-2789. Records Disposition. Ensure that all records created by this AFI are maintained and disposed of IAW AFMAN 37-139, "Records Disposition Schedule."

**SUMMARY OF REVISIONS**

This revision incorporates Interim Change IC 2003-1. This interim change clarifies separation of T/AT-38 aircraft during execution of G-awareness exercises (paragraph 3.2.1.). It deletes the discernible horizon requirement for LIMITED maneuvering (paragraph 5.2.7.2.1.). It adds a statement allowing aircraft to perform stern conversions against a non-maneuvering target in meteorological conditions that otherwise mandate restricted or non-maneuvering intercepts (paragraph 5.2.7.3. and 5.2.7.4.). It also deletes weather restrictions for restricted maneuvering categories for fixed wing aircraft (paragraph 5.2.7.3.1.).

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## Chapter 1

### INTRODUCTION

#### 1.1. General Information:

1.1.1. Purpose. This instruction provides rules and procedures for Air-to-Air and Air-to-Surface operations, and training for those missions listed in AFDD1, Air Force Basic Doctrine.

1.1.2. Responsibilities Assigned. Aircrew may perform operations or procedures not specifically addressed in this instruction only if they enhance safe, effective mission accomplishment. This instruction is not a substitute for sound judgment or common sense.

1.1.3. MAJCOM Responsibilities. MAJCOMs may change, or add procedures, as applicable, to this instruction, but must ensure changes are no less restrictive than the basic instruction. If supplemented, MAJCOMs must send one copy each to HQ USAF/XOCE and HQ ACC/DOTW.

1.1.4. Waivers. Send waiver requests to this instruction to appropriate MAJCOM DO/XO for approval. MAJCOMs will forward copies of all approved waivers to HQ ACC/DO. Exercise directors will brief all participants on waivers prior to conducting associated activities.

**1.2. Scope.** This instruction prescribes unclassified procedures for the execution of both operational and training missions. To the maximum extent possible this instruction publishes generic procedures applicable to all aircraft. Effective use of this instruction comes from a sound knowledge of current tactics and operational procedures.

**1.3. Definitions.** [Attachment 1](#) provides definitions for most terms applicable to air operations and training.

**1.4. Distribution.** Each aircrew, ABM/WD, and TAC is authorized a copy of this instruction.

## Chapter 2

### GENERAL OPERATIONAL AND TRAINING PROCEDURES

**2.1. General Information.** This chapter provides general procedures applicable to Air-to-Air and Air-to-Surface scenarios for both operational and training missions.

**2.2. Philosophy.** Successful mission accomplishment demands effective coordination among all participants to include command authorities, controlling agencies, friendly surface-to-air sites, and airborne weapons systems. Operation Plans (OPLAN) and Operation Orders (OPORDs) will provide the foundation for this coordination.

**2.3. General Aircrew, ABM/WD, and TAC Responsibilities:**

- 2.3.1. Use the procedures described in MDS-specific AFTTP 3-1s and 3-3s.
- 2.3.2. Be familiar with the capabilities and limitations of communications, control facilities, coordination requirements, and other weapons systems employed for mission accomplishment.
- 2.3.3. For all missions, be knowledgeable of the applicable OPLAN/OPORD, Master Air Attack Plan (MAAP), Air Defense Plan, Airspace Control Plan, and review the daily Air Tasking Order (ATO), Airspace Control Order (ACO), and any other source available affecting the assigned area of responsibility (AOR) and/or joint operations area (JOA).
- 2.3.4. Understand the states of alert, readiness, warning, and ROE within the operational commands' areas of responsibility.
- 2.3.5. Know and comply with authentication procedures.
- 2.3.6. Know the characteristics and capabilities of the threat.
- 2.3.7. Know the tactics described in appropriate tactics manuals. Employ as the tactical situation dictates.
- 2.3.8. Know and comply with theater or region integrated air defense and airspace control procedures to include Minimum Risk (Safe Passage) procedures, free fire zones, location of known friendly and enemy Surface-to-Air Missile (SAM) sites, recovery airfield status, etc.
- 2.3.9. Know and comply with local operating procedures and/or Training Rules (TRs).
- 2.3.10. Know the responsibilities and procedures associated with the assigned AOR.
- 2.3.11. As a minimum use Attachment(s) 2-5 (as applicable) as a guide to coordinate/brief prior to missions.

**2.4. Initial Check-in and Recovery Procedures.** Aircrews will check-in with the controlling agency, such as ABM/WD, Forward Air Controller (FAC)/TAC, as described below, unless restricted by the ATO. Some or all of the following calls may be omitted as required for Operations Security (OPSEC) or Communications Security (COMSEC).

- 2.4.1. Pass the following information at initial check-in:
  - 2.4.1.1. Call sign and number of aircraft in the flight/package.

- 2.4.1.2. Authenticate as required.
- 2.4.1.3. Deviations or aborts affecting mission accomplishment.
- 2.4.1.4. Mission or weapons system alibis that affect mission accomplishment.
- 2.4.2. The ABM/WD, FAC/TAC will accomplish the following:
  - 2.4.2.1. Authenticate as required.
  - 2.4.2.2. Indicate negative/positive radar contact (if applicable).
  - 2.4.2.3. If equipped with Identification Friend or Foe/Selective Identification Feature (IFF/SIF), conduct an IFF/SIF check and advise aircrew of status only if "Sour" ("Sweet" is assumed).
  - 2.4.2.4. Provide a brief situation update (ABM/WD: "PICTURE" for Air-to-Air, "LOWDOWN" and "PICTURE" for Air-to-Surface") to include location of friendly forces, civilians and no fire areas.
  - 2.4.2.5. Pass information pertinent to mission accomplishment. Do not pass information already in the ATO/ACO unless it requires special emphasis or required by the 9-line format used in support of Close Air Support (CAS) operations.
  - 2.4.2.6. Provide working frequency or net, and Time-of-Day (TOD) (if applicable).
  - 2.4.2.7. Transfer control to the designated control element and controller, such as the ABM/WD, TAC, FAC(A), etc., (as applicable).
- 2.4.3. The controlling agency/aircrews may be required to provide additional information, such as:
  - 2.4.3.1. Information pertinent to mission accomplishment that was not included in the ATO/ACO or SPINS and any applicable updates to changes in fire support coordinating measures, airspace control measures, and/or weapons engagement zones.
  - 2.4.3.2. Available Air-to-Air armament. Use Air-to-Air armament available by stating number of active, semi-active, and number of IR missile available. For example, use "2x2x2" for 2 AIM120, 2 AIM7, and 2 AIM9.
  - 2.4.3.3. Available Air-to-Surface armament.
  - 2.4.3.4. Fuel Status. Pass fuel status by indicating the amount of playtime in minutes the flight has above "BINGO" fuel. (e.g., "VIPER, PLAYTIME 50").
  - 2.4.3.5. Electronic Order of Battle update.
  - 2.4.3.6. Status of Support Assets. At check in, the mission commander should receive words on the status of OCA/ESC, SEAD, and C2ISR packages supporting his/her mission.
- 2.4.4. Recovery. The type of conflict and theater of operations will determine controlling agency priorities and the urgency of recovering aircraft.
  - 2.4.4.1. During recovery, aircrews will contact the controlling agency with the following:
    - 2.4.4.1.1. Call sign and recovery base. If available for commit, transmit "PLAYTIME."
    - 2.4.4.1.2. Mission results and intelligence consistent with operational command requirements and COMSEC procedures.

2.4.4.1.3. For Air-to-Ground, if ordnance and/or fuel is available transmit "PLAYTIME" and minutes available.

2.4.4.2. The ABM/WD will, as conditions require:

2.4.4.2.1. Provide recovery instructions including base status and weather.

2.4.4.2.2. Copy and relay in-flight mission and/or weather reports.

2.4.4.2.3. Assist in Minimum Risk (Safe Passage) procedures.

2.4.4.2.4. Accomplish hand-off to recovery agency (normally an air traffic control (ATC) center).

**2.5. Scenario Changes.** Before the "FIGHT'S ON" call, exercise directors, mission commanders, and flight leads will notify and receive acknowledgment from all aircrews and ABMs/WDs for any scenario changes affecting safety of flight (e.g., airspace changes, weather in working area, block changes, altimeter setting, etc.).

**2.6. Exercises.** The following instructions apply to major exercises including Flag Exercises, Operational Readiness Inspections (ORI), surges, and composite force training (CFT) exercises:

2.6.1. Special Instructions (SPINS). Exercise directors will publish and brief SPINS unique to their exercise.

2.6.2. Qualifications. Commanders will ensure that exercise participation is limited to those events that aircrews and ABM/WD are qualified to perform.

2.6.3. Briefing Requirements. Exercise directors will brief participants unfamiliar with this instruction to ensure they know and understand the TRs. For additional joint live fire briefing requirements, refer to paragraph 6.8. Exercise directors will also publish modifications to TRs in the exercise planning document to accommodate differences in TRs.

2.6.4. Pre-Mission Briefings:

2.6.4.1. Pre-mission briefings will include the applicable portions of the TRs and exercise SPINS.

2.6.4.2. The mission commander, flight lead, a squadron or wing supervisor (flight commander or higher), weapons officer, or Inspector General (IG) representative will conduct daily telephonic mission briefs, e-mail, and/or Video Teleconference with participating units in exercises when operational constraints make it impractical for face-to-face briefings. This supervisor does not need to be flying in the mission, but must be a fully knowledgeable exercise participant.

2.6.5. Minimum Cloud Clearance During Flag and Cope Thunder Exercises. The exercise director determines the extent of Air-to-Air participation when a ceiling is a factor, and may allow a reduced number of Red Force Air-to-Air participants below the ceiling to engage Blue Force Air-to-Surface participants. The exercise director may also reduce the vertical cloud separation beneath a ceiling to 500 feet (1,000 feet when above 10,000 feet MSL) when accomplishing all the following:

2.6.5.1. Restrict Blue Force Air-to-Surface participants to remain within the surface to 1,000 feet AGL block (except for weapons delivery),

2.6.5.2. Restrict Blue Force Air-to-Air participants from operating below the ceiling, and

2.6.5.3. Terminate communications jamming.

2.6.5.4. The exercise director may allow only Blue Force to operate below the deck if two full altitude blocks are not available.

2.6.6. Separation of Aircraft. Exercise directors and mission commanders will develop and implement deconfliction plans that provide adequate separation of participating aircraft. Use any combination of time, space (assigning specific geographical areas to flights), or altitude blocks to deconflict participating aircraft. See paragraph [5.2.8.](#) for specifics details.

## Chapter 3

### GENERAL TRAINING RULES

**3.1. Introduction.** This chapter provides general training rules and procedures for day and night operations.

**3.2. Training Rules (TRs).** This section provides TRs applicable to both Air-to-Air and Air-to-Surface training.

3.2.1. The following will completely replace paragraph 3.2.1.: G-Awareness Exercise. Fly G-awareness exercise in airspace that is free from potential conflict. Flight members will maintain a minimum of 6000' between aircraft (4000' between T/AT-38), during the execution of all G-awareness exercises. Fly G-awareness exercises for the following circumstances.

3.2.1.1. For aircraft requiring a G-suit, anytime aircrews plan or are likely to maneuver above five Gs during the mission.

3.2.1.2. For aircraft not requiring a G-suit, anytime aircrews plan or are likely to maneuver above four Gs during the mission.

3.2.2. Single-Ship Operations. Units will fly training missions commensurate with expected wartime tasking. This does not restrict units from flying single-ship missions to meet training requirements (advanced handling, instruments sorties, red air, etc.). Units will specify fallout and single-ship operations in local operating instructions. The Operations Supervisor (SOF for AFRC and ANG) will be prebriefed on and will approve single-ship operations. These rules also apply to any single-ship alternate missions resulting from fallout. For additional Air-to-Air restrictions see paragraph 5.2.1.2. For additional Air-to-Surface restrictions see paragraph 6.3.4.

3.2.3. Knock-It-Off (KIO) and Terminate Procedures: Use KIO or Terminate procedures to direct aircraft to stop engagements or scenarios and cease tactical maneuvering.

3.2.3.1. KIO Procedures. Use KIO procedures to cease all tactical maneuvering when safety of flight is a factor, where doubt or confusion exists, or when Desired Learning Objectives (DLOs) are met for an entire scenario. All participants will stop engagements, the scenario and cease tactical maneuvering. Transmit "KNOCK-IT-OFF" and make directive radio calls to any participant(s) if danger is imminent. Situations requiring KIO procedures include:

3.2.3.1.1. A dangerous situation is developing.

3.2.3.1.2. Loss of situational awareness (SA).

3.2.3.1.3. Weather below minimums required to safely accomplish the scenario.

3.2.3.1.4. Engaged aircraft exceeds maneuvering limits such that safety of flight is compromised.

3.2.3.1.5. Desired Learning Objectives are met for the entire scenario.

3.2.3.1.6. Any player calls "KNOCK-IT-OFF."

3.2.3.1.7. An unbriefed or unscheduled flight enters the working area and is detrimental to the safe conduct of the mission.

3.2.3.1.7.1. In this situation, contact the appropriate controlling agency and attempt to determine the aircraft's identity and intentions (if known). Monitor the aircraft through the controlling agency, onboard radar, and/or visual contact until it is no longer a factor.

3.2.3.2. When hearing a "KNOCK-IT-OFF" call, all participating aircraft will:

3.2.3.2.1. Clear flight path.

3.2.3.2.2. Cease tactical maneuvering.

3.2.3.2.3. Climb or descend to a prebriefed safe altitude.

3.2.3.2.4. Acknowledge with call sign. Address any additional problems/issues. Obtain verbal clearance from the exercise director/representative before resuming maneuvers.

3.2.3.3. Use Terminate procedures when safety of flight is not a factor and to indicate stopping ownship maneuvering. Indicates to other participants to cease engagements and tactical maneuvering with terminating aircraft and/or within a specific portion of a larger scenario and to proceed as briefed or directed. Initiate terminate procedures with a wing rock. Transmit "TERMINATE" when conditions are not appropriate for a wing rock (night/weather, ownship parameters will not allow, etc.). If transmitting "TERMINATE" during a large force exercise, anchor position geographically or with a bullseye reference ("(Callsign), terminate south fight" or "(Callsign), terminate fight, BULLSEYE 180/10"). Use amplifying information if necessary (altitude, type aircraft, geographical feature). Situations requiring Terminate procedures include:

3.2.3.3.1. A violation of any of the following has occurred or appears imminent: exceeding area boundaries, below minimum cloud separation, below minimum altitude, or within minimum range which do not compromise the safe conduct of the entire scenario.

3.2.3.3.2. Recognized radio failure.

3.2.3.3.3. Observing a wing rock.

3.2.3.3.4. Reaching BINGO fuel.

3.2.3.3.5. Desired learning objectives are met for a local engagement.

3.2.3.3.6. Stalemate.

3.2.3.3.7. Airspeed below MDS minimum for phase of flight.

3.2.3.3.8. Training rules or other limits met (e.g., 180-degree turn).

3.2.3.3.9. To cease maneuvering for exercise not begun with a "Fight's On" call, such as High Angle Snap Shot gun exercise or part-task Air-to-Air or Air-to-Surface exercises.

3.2.3.4. After receiving a "TERMINATE" transmission or observing a momentary wing rock, all participating aircraft within a nominal visual range will:

3.2.3.4.1. Clear flight path.

3.2.3.4.2. Cease tactical maneuvering.

3.2.3.4.3. Acknowledge with call sign or wing rock.

3.2.3.4.4. Proceed as briefed or directed.

3.2.4. Communications Jamming (Comm Jam) Procedures:

3.2.4.1. Exercise directors will brief procedures to all personnel directly associated with comm jam missions (aircrews, ABMs/WDs, jammers, TACP) to include jam free and safety frequencies, and lost comm procedures. Accomplish comm jam only in tactical training areas.

3.2.4.2. Preface all transmissions required for safety (e.g., weather changes, airspace advisories, etc.) with "SAFETY, SAFETY." Upon hearing this call all jammers on the frequency will cease jamming to allow the transmission.

3.2.4.3. Transmit "KNOCK-IT-OFF" to terminate both comm jamming and maneuvering.

3.2.4.4. Any person employing communications spoofing will not use terms with safety implications, e.g., "KNOCK-IT-OFF," "CHATTER-MARK," or "SAFETY" as communications jamming tactics.

3.2.4.5. Do not conduct jamming on Guard or any predesignated safety frequency.

3.2.4.6. In training, do not comm jam during the following activities:

3.2.4.6.1. Aerial refueling.

3.2.4.6.2. Actual personnel or cargo air drops.

3.2.4.6.3. Aircraft in distress.

3.2.4.6.4. Actual Search and Rescue (SAR) missions.

3.2.4.6.5. Operational (non-training) missions.

3.2.4.6.6. VIP flights (unless pre-approved by exercise director).

3.2.4.7. Publish techniques for instituting chattermark procedures in the ATO or OPlan, when required. Commands should establish chattermark procedures for regular training use and for their areas of responsibility.

3.2.5. Chaff, Flare, and Smokey Devil Procedures:

3.2.5.1. Arm chaff, flare, and Smokey Devil systems only in an approved area with an intent to dispense.

3.2.5.2. Smokey Devil or Flare Employment:

3.2.5.2.1. Restrict employment of originally manufactured Smokey Devils to government owned or controlled property including over water warning areas. Minimum employment altitude is 500 feet AGL.

3.2.5.2.2. Aircrews may employ flares when operating over government owned or controlled property (including over water warning areas) using the following minimum altitudes:

3.2.5.2.2.1. No fire hazard: No minimum altitude unless a higher altitude is specified in range orders.

3.2.5.2.2.2. Fire hazard: According to applicable AFI 11-2MDS series directives or range orders.

3.2.5.2.3. In training areas over other than government-owned or controlled property, minimum flare employment altitude is 2,000 feet AGL unless specified otherwise in governing regulations.

3.2.5.2.4. Value Engineering Change Proposal Smokey Devils (VECP SD) minimum altitude for employment is 300 feet. Aircrews may employ flares and VECP SD in a non-government owned or controlled training areas (i.e., Military Operating Areas (MOA), Military Training Routes (e.g., IR, VR)) only if the training area has an approved AF Form 813, Request For Environmental Impact Analysis. Aircrews need to contact local airspace manager for information.

3.2.5.3. When employing chaff in the U.S. and Canada, refer to CJCSM 3212.02, *Performing Electronic Attack In the U.S. and Canada For Tests, Training, and Exercises*, and/or in accordance with published range orders. Outside the U.S. and Canada, refer to host nation rules governing the employment of chaff.

3.2.6. Day, Night, and Civil Twilight Procedures. Use day rules and procedures (operational and training) during civil twilight (defined in the air almanac maintained by base weather). Use night or weather procedures when adverse conditions exist during civil twilight. Without access to the air almanac, consider civil twilight to be 30 minutes before sunrise until sunrise, and from sunset until 30 minutes after sunset.

3.2.7. Overland-Overwater Transition. When transitioning from overland to overwater, or when over terrain without attitude references, aircrews will ensure they are in a level or climbing flight attitude to anticipate a reduction in visual cues. The intent is to maintain spatial orientation primarily through use of visual cues with instrument crosschecks as a backup.

3.2.8. Transition to low altitude (N/A for helicopters). Maximum dive angle for maneuvering below 5,000 feet AGL is the lesser of 45 degrees or one percent of your AGL altitude (e.g., 40 degrees nose low at 4,000 feet AGL, 30 degrees nose low at 3,000 feet AGL, etc.). Reduce dives starting above 5,000 feet AGL to 45 degrees or less before passing 5,000 feet AGL. MAJCOM guidance, -34 series T.O.s, the tactical situation, the weather, and this instruction will dictate planned weapons delivery maximum dive angles.

**3.3. Night Training Rules.** This section adds additional night TRs applicable to both Air-to-Air and Air-to-Surface night training (see [Chapter 5](#) and [Chapter 6](#) for additional rules). For AFSOC assigned/gained aircraft and aircraft operated under AFSOC lead command guidance, see AFSOC publications. For AMC assigned/gained aircraft and aircraft operated under AMC lead command guidance, see basic MDS or AMC publications.

#### 3.3.1. Night Lighting and Illumination:

3.3.1.1. Aircraft Lighting Category Definitions. (Note: These definitions do not relieve aircrews from complying with FAA aircraft lighting restrictions).

3.3.1.1.1. Full-up: Normal aircraft lighting IAW AFI 11-202, Vol 3.

3.3.1.1.2. Reduced: Anti-collision and strobe lights off, position lights on.

3.3.1.1.3. Covert: Night lighting visible through NVGs but not visible to the naked eye.

3.3.1.1.4. Lights-out: All external lights off.

#### 3.3.1.2. Illumination Levels:

3.3.1.2.1. High Illumination (HI) is defined as illumination, derived from natural or artificial sources, of 2.2 millilux illumination or greater, unless defined otherwise in AFI 11-2MDS series instructions.

3.3.1.2.2. Low Illumination (LI) is defined as less than 2.2. millilux, unless defined otherwise in aircraft specific AFI 11-2MDS series instructions.

3.3.1.2.3. In aircraft not equipped with in-flight illumination measuring devices, the flight lead or individual pilot is the final determining authority to assess actual illumination for a particular mission element, based on visibility and terrain features/resolution.

3.3.1.2.4. Missions planned for HI may transition to LI TRs in-flight depending upon weather, moon rise/ set, artificial illumination, etc., but missions planned for LI cannot transition to HI TRs.

3.3.2. Minimum Altitude. The minimum altitude at night is the lowest minimum safe altitude (MSA), TF/TA or NVG minimum altitude as appropriate. Special Operations/airlift/rescue aircraft may operate below the MSA according to AFI 11-2MDS series regulations.

3.3.3. Night Threat Reactions:

3.3.3.1. With HI, the minimum altitude for NVG operations is 1,000 ft AGL.

3.3.3.2. With LI, the minimum altitude for NVG operations is MSA.

3.3.3.3. For rotary-wing NVG equipped aircrew, minimum altitude for threat reactions is 100 feet AGL.

3.3.3.4. Special Operations aircraft may operate below these altitudes according to AFI 11-2MDS series regulations.

3.3.4. NVG Mission Planning and Operational Considerations.

3.3.4.1. Mission Planning.

3.3.4.1.1. NVG pre-mission planning will be accomplished using a DOD-approved light level planning program.

3.3.4.1.2. If ambient illumination is low and artificial illumination is planned to enhance the mission, a "no flares/artificial illumination" back-up option will be briefed.

3.3.4.1.3. All flights will plan LI and no-NVG back-up options (N/A for helicopters).

3.3.4.2. Operational Considerations.

3.3.4.2.1. When only a portion of participating aircraft is NVG-equipped, inter-flight deconfliction will be accomplished using visible lighting or positive altitude/area deconfliction. All aircraft will halt any reduced, covert, or lights-out operations when a "KNOCK-IT-OFF" occurs until positive separation of aircraft is ensured.

3.3.4.2.2. Failure of any portion of the NVGs requires an immediate transfer to instruments and establishment of non-NVG procedures. Resume NVG operations only after correcting the NVG malfunction.

## Chapter 4

### AIR REFUELING RULES

#### 4.1. General Procedures:

4.1.1. ABMs/WDs and aircrews will confirm altimeter, weapons safe calls, and monitor altitude separation for rendezvous except during EMCON Option 3 and 4.

**4.2. Tanker Abort.** Tanker aircrew will inform receivers and the controlling agency if it experiences problems preventing it from completing the air refueling. The ABM/WD will assist aircrews as necessary. The tanker aircraft commander will ensure aircraft separation and inform the receiver and ABM/WD of intentions.

#### 4.3. Tactical Considerations and Communications Options:

4.3.1. Communications During Air Refueling. Effective combat operations in a tactical environment may require emission control. All elements involved in the refueling operation will employ radio silent and emission control procedures to the maximum extent possible. Procedures need to be consistent with the command and control procedures, receiver and tanker proficiency, and flight safety. Minimized radio transmissions between command and control, the receivers, and the tankers require a pre-planned and coordinated off load, refueling order, ARCP, ARCT, and end air refueling point.

4.3.1.1. All participants will be familiar with the type rendezvous, rendezvous point and time, tanker and receiver altitudes, missed rendezvous procedures, and back-up communications procedures.

4.3.1.2. The ATO will contain the EMCON Option if other than EMCON 2. The ATO will also explain any different options used during different segments of the mission.

4.3.1.3. Use communications as necessary during emergencies or unsafe situations.

4.3.1.4. The following communication procedures apply if/when necessary during air refueling operations:

4.3.1.4.1. Aircrews will acknowledge all ABM/WD airspace and safety related calls.

4.3.1.4.2. ABM/WD procedures:

4.3.1.4.2.1. Direct air refueling missions consistent with the continuum of control.

4.3.1.4.2.2. Ensure altimeter settings are passed to all players.

4.3.1.4.2.3. Ensure receivers acknowledge "weapons safe" calls.

4.3.1.4.2.4. If required obtain and pass all post-refueling off-load information.

4.3.1.4.2.5. Acknowledge all aircrew safety related calls.

4.3.1.4.2.6. Advise the aircrews of the bearing, range, heading, and altitude (if available) of previously unreported aircraft within 10 miles that are potential conflict.

4.3.1.4.2.7. Advise aircrews when approaching airspace/refueling area boundaries.

4.3.1.4.2.8. Provide all pertinent information (e.g., tanker/boom operator frequencies, threats, mission changes, airspace changes, weather, system degradation, etc.)

4.3.1.5. For all standard refueling rendezvous, the following roll-out criteria applies: For “speed-advantage” receivers, tanker aircraft will be positioned to achieve a 1-3 nm rollout in front of the receiver within a 60-degree cone (+/- 30 degrees of the receiver). For “speed-disadvantage” receivers, confirm with receivers desired rollout separation.

#### **4.4. Special Procedures:**

4.4.1. Systems Malfunctions. Except during fuel emergencies, do not conduct air refueling when any system malfunction or condition exists which would jeopardize safety.

4.4.2. Lost Wingman Procedures. The ABM/WD will assist as necessary to maintain separation between all aircraft.

## Chapter 5

### AIR-TO-AIR TRAINING RULES

**5.1. Introduction.** This chapter provides rules that apply to all categories of Air-to-Air training.

**5.2. General Air-to-Air Training Rules:**

**5.2.1. Briefing and Debriefing Requirements:**

5.2.1.1. Accomplish face-to-face briefings for normal day-to-day training. Conduct telephonic or electronic briefings when circumstances prevent face-to-face briefings or debriefings. Conduct airborne briefings when circumstances prevent face-to-face or telephone briefings, and only when tactically sound. MAJCOMs will authorize alternate briefing procedures for unusual circumstances.

5.2.1.2. As a minimum, face-to-face, telephonic and electronic briefings will cover the items in the Air-to-Air coordination and briefing guide in [Attachment 2](#). For electronic briefings, confirm that the briefing is received and understood by the recipient. For aircrew, AWACS, and JSTARS coordination guides see [Attachment 3](#) and [Attachment 4](#). For bomber coordination guide, see [Attachment 5](#).

5.2.1.3. Flight debriefings will critically assess mission execution and offer solutions to problems encountered.

5.2.2. **Airspace:** Conduct training within designated airspace. Both aircrews and ABM/WDs share joint responsibility in avoiding lateral spill-outs. It is the aircrews' responsibility to avoid vertical spill-outs.

5.2.3. **Communications.** Basic procedures are in [Chapter 2](#) and [Chapter 3](#). The following additional procedures apply to Air-to-Air training:

5.2.3.1. Aircrews will acknowledge all ABM/WD airspace and safety related calls.

5.2.3.2. ABM/WD procedures:

5.2.3.2.1. Advise aircrews of the bearing, range, heading, and altitude (if available) of previously unreported aircraft within 10 miles that are a potential hazard.

5.2.3.2.2. Advise aircrews when the controlling agency cannot support a minimum of broadcast control. In this situation only continue an engagement if the aircrew can provide safe separation.

5.2.3.2.3. Advise aircrews when they approach airspace boundaries.

5.2.3.2.4. Provide other pertinent information (e.g., airspace changes, weather in working area, system degradation, etc.).

5.2.3.2.5. Periodically transmit "CHECK FUEL" to assist aircrews in fuel awareness.

5.2.3.2.6. If prebriefed, make the following calls:

5.2.3.2.6.1. Vectors to position aircraft for initial setups.

5.2.3.2.6.2. Advise aircrew of MSA.

5.2.3.3. Use separate frequencies for opposing forces provided:

5.2.3.3.1. ABMs/WDs and/or RTOs have simultaneous monitor and broadcast capability on each working frequency or a dedicated communication link exists between AWD/WDs and participating aircraft.

5.2.3.3.2. ABMs/WDs and/or RTOs will immediately pass all KNOCK-IT-OFFs, Terminates, and safety of flight information to all participating aircraft.

5.2.4. Explosive Chaff. Use of explosive chaff in Air-to-Air training is subject to the following conditions:

5.2.4.1. Brief all participants on the use of explosive chaff.

5.2.4.2. Only dispense explosive chaff when the fighter range is 1 nm or greater, or the fighter attacks from above and remains above the aircraft dispensing explosive chaff.

5.2.4.3. Chaff dispensed from an ALE-40, ALE-45, ALE-47, and M-130 is not considered explosive chaff.

5.2.4.4. Comply with provisions in paragraph [3.2.5.3](#).

5.2.5. Aircraft Configuration:

5.2.5.1. Live External Air-to-Air Missile Carriage:

5.2.5.1.1. Do not fly with live Air-to-Air missiles in peacetime, except under the following circumstances:

5.2.5.1.1.1. Air defense alert aircraft.

5.2.5.1.1.2. Air defense aircraft during changeover sorties.

5.2.5.1.1.3. Weapon System Evaluation Program (WSEP), and Operational Test and Evaluation (OT&E) programs.

5.2.5.1.1.4. Aircraft flown following generation exercises.

5.2.5.1.1.5. As authorized by MAJCOM/DO (or equivalent), service directives, or OPlan tasking.

5.2.5.1.2. The following requirements apply to authorized carriage of live external Air-to-Air missiles for other than WSEP firings:

5.2.5.1.2.1. Aircrews will make a "WEAPONS SAFE" call upon initial check-in and before each setup following a KIO or terminate. Check the master arm switch in the SAFE, SIM, OFF, or equivalent position, and use the weapons panel or Heads Up Display (HUD) to verify the "Weapons Safe" position.

5.2.5.1.2.2. Do not squeeze trigger or depress the pickle button.

5.2.5.1.2.3. With no intent to employ live Air-to-Air missiles, maximum maneuvering category is LIMITED.

5.2.5.2. Gun Employment:

5.2.5.2.1. To prevent inadvertent firings when simulating gun employment ensure the following:

5.2.5.2.1.1. Have no ammunition loaded or safe the gun according to –34 Series T.O.s.

5.2.5.2.1.2. Perform a trigger check (trigger squeeze) before simulated gun employment.

5.2.5.2.2. To simulate missile employment with a gun that cannot be safed, accomplish all of the following:

5.2.5.2.2.1. Load no live missiles.

5.2.5.2.2.2. Place the master arm switch in the SAFE, SIM, OFF, or equivalent position.

5.2.5.2.2.3. Verify the weapons panel or HUD display SAFE, SIM, OFF, or equivalent position.

5.2.5.2.2.4. Do not squeeze the gun trigger.

5.2.5.2.3. When training with a live gun, ensure:

5.2.5.2.3.1. Minimum distance between aircraft is 6000 feet.

5.2.5.2.3.2. Place the master arm switch in the SAFE, SIM, OFF, or equivalent position.

5.2.5.2.3.3. Verify the weapons panel or HUD display SAFE, SIM, OFF, or equivalent position.

5.2.5.2.3.4. Do not squeeze the gun trigger.

5.2.5.2.3.5. No simulated gun employment.

5.2.5.3. Air-to-Air Laser Employment:

5.2.5.3.1. Eye Safe Laser Setting. Laser-equipped aircraft may use an eye safe laser setting (1.54 microns) at any time. Aircrew Laser Eye Protection (ALEP) is not required.

5.2.5.3.2. Combat Laser Setting. Laser-equipped aircraft are prohibited from using a combat laser setting (1.06 microns) during peacetime training missions except in the following circumstances:

5.2.5.3.2.1. WG/CC specifically approves A/A laser operations for a specific training exercise, test, or WSEP.

5.2.5.3.2.2. All participants will wear approved ALEP.

5.2.5.3.2.3. Lasing aircraft will cease laser use within 2 miles of another manned aircraft.

5.2.5.3.2.4. Unit will contact and abide by current guidelines established by Armstrong Lab (AL/OEO), Brooks AFB, TX.

5.2.6. Fuel Requirements:

5.2.6.1. Establish fuel minimums for each mission.

5.2.6.2. Perform a fuel check before the first engagement and before subsequent engagements after a KIO or Terminate.

5.2.7. Fixed-Wing Maneuvering. This section provides maneuvering categories for aircraft during Air-to-Air training missions. This section also specifies the maximum maneuvering allowed during Air-to-Air training based on flight conditions (day, night, or weather), altitude, and configuration. The rules of this instruction, MAJCOM or service directives, or aircraft limitations apply, whichever is the

more restrictive. Flight leaders may, if required for training, place further limits on one or both sides of an engagement depending on mission objectives or conditions.

5.2.7.1. UNLIMITED. Provides for Air-to-Air training with no limitations on maneuvering other than AFI 11-2MDS and flight manual aircraft limitations.

5.2.7.1.1. Weather Requirements: 2,000 feet vertical and 1 nm horizontal cloud clearance, 5 nm (8 km USAFE) visibility, and discernible horizon.

5.2.7.1.2. Minimum altitude is 5,000 feet AGL after the engagement begins (defined as once both opposing aircraft have begun visual maneuvers to achieve or prevent a weapons firing position). Do not allow engagement to continue below 5,000 feet AGL. If below 5,000 feet AGL, cease maneuvering, and continue in accordance with pre-mission briefing.

5.2.7.2. LIMITED. Provides for Air-to-Air training with the following limitations.

5.2.7.2.1. The following will completely replace paragraph 5.2.7.2.1. Weather Requirements: 2,000 feet vertical and 1 nm horizontal cloud clearance, 5 nm (8 km USAFE) visibility.

5.2.7.2.2. A defender is an aircraft attempting to defeat or deny an adversary's weapons employment. With an attacker behind the 3/9 line, a defender can react with an extension, a separation, a turn not to exceed 180 degrees (level or climbing if at low-altitude), or a wing rock. No maneuvering restrictions apply when the attacker is on or forward of the 3/9 line.

5.2.7.2.3. Attackers (aircraft simulating Air-to-Air ordnance and maneuvering offensively) engaging each other have no maneuver restrictions pre-merge. Attackers will not turn more than 180 degrees, in an attempt to shoot each other, after reaching each other's 3/9 line.

5.2.7.2.4. An attack can continue until:

5.2.7.2.4.1. A "TERMINATE" or "KNOCK IT OFF" call

5.2.7.2.4.2. A wing rock

5.2.7.2.4.3. An achieved kill

5.2.7.2.4.4. A role reversal

5.2.7.2.4.5. A attacker or defender reaches 180 degree of turn post 3/9 passage.

5.2.7.2.5. Upon disengagement, aircraft will extend beyond visual range before reengagement. Extension beyond visual range before reengagement is not required for AMWC CADS WIC or AATTC training syllabus sorties. AMWC CADS WIC, and AATTC syllabus sorties will ensure that after the initial attack, all aircraft cease tactical maneuvering and any pre-briefed follow-on attacks will not be initiated until maneuvering airspeeds, altitudes, and pre-briefed separation parameters have been established.

5.2.7.3. The following will completely replace paragraph 5.2.7.3.: RESTRICTED. Provides for Air-to-Air training with heading changes of up to 60 degrees either side of course. This does not apply to aircraft performing stern conversions versus RESTRICTED maneuvering targets.

5.2.7.3.1. DELETED

5.2.7.4. The following will completely replace paragraph 5.2.7.4.: NON-MANEUVERING. Provides for Air-to-Air training by maintaining constant heading, airspeed, and altitude. This does not apply to aircraft performing stern conversions versus NON-MANEUVERING targets.

5.2.7.5. CONTROLLED. Provides for Air-to-Air 1 v 1 night visual training conducted with NVGs. Maneuvers are fluid and continue beyond 180 degrees, but maneuvering options of the defensive fighter are predetermined and restricted to a maximum of 540 degrees. Controlled maneuvering may only be conducted as authorized in applicable volumes of AFI 11-2MDS series guidance. Abide by the following restrictions:

5.2.7.5.1. Minimum altitude is 5000 feet AGL.

5.2.7.5.2. Weather Requirements. 2,000 feet vertical and 1 nm horizontal cloud clearance, 5 nm (8 km USAFE) visibility, and discernible horizon, HI and with lunar elevation above the horizon.

5.2.7.5.3. Maximum participating aircraft: two.

5.2.7.5.4. Visual set-ups only.

5.2.7.6. Night: LIMITED maneuvering is the normal night Air-to-Air training maneuvering category and is the maximum category for any non-NVG night operations or any NVG-equipped aircrews conducting intercepts (i.e., intercepts will not be flown to CONTROLLED maneuvering). In addition to restrictions in paragraphs 5.2.7.2. through 5.2.7.5., the following restrictions apply:

5.2.7.6.1. For night definition see section 3.2.6. During periods approaching sunrise/sunset, zodiacal light must be considered when attempting NVG use. When IR light from a recent sunrise or pending sunset precludes NVG use, attempt to change aircraft heading away from the zodiacal light. If that option is not practical, revert to LI minimums until the sun sets sufficiently for normal NVG use or the sun rises sufficiently for unaided vision. For additional night guidance, see section 3.3.

5.2.7.6.2. Include frequent flight instrument cross-checks during all engagements.

5.2.7.6.3. Coordinate all altitude changes in IMC to ensure aircraft separation requirements.

5.2.7.6.4. No "visual-only" Air-to-Air training for non-NVG equipped aircraft.

5.2.7.7. Additional night limitations when operating with NVGs:

5.2.7.7.1. For NVG-equipped aircrew, visual-only commits are authorized if a discernable horizon exists, target line-of-sight (LOS) motion is observed, and range/altitude to complete the intercept is perceived. If no target LOS is observed, or range/altitude to complete the intercept is not perceived using NVGs, another instrument or sensor must be used to complete the intercept, finish the conversion, and/or pursue the target. If a discernable horizon is lost during the conduct of the intercept, revert to non-NVG night operations and insure safe separation of aircraft. If unable, discontinue the intercept.

5.2.7.8. Day, Low Altitude, Visual Maneuvering Below 5000 feet AGL (below 5,000 feet AGL constitutes low altitude):

5.2.7.8.1. LIMITED is the maximum maneuvering category.

5.2.7.8.2. Weather requirements: 2,000 feet vertical and 1 nm horizontal cloud clearance, 5 nm (8 km USAFE) visibility, and discernible horizon.

5.2.7.8.3. Determine maneuvering categories on the altitude of the lowest participant in the engagement when the engagement begins. The engagement is a "low-altitude" engagement under any aircraft is below 5,000 feet AGL at start of engagement.

5.2.7.8.4. Do not perform rolling or exaggerated vertical maneuvering.

5.2.8. Separation of Aircraft: Minimum range during operations between fighter aircraft during Air-to-Air training is 500 feet or MAJCOM and service minimum, whichever is greater. If a violation of minimum range appears imminent or has occurred, each aircraft will perform a "KNOCK-IT-OFF/TERMINATE".

5.2.8.1. Assign hard altitudes or altitude blocks to provide vertical separation for non-visual set-ups.

5.2.8.1.1. A minimum of 1,000 feet vertical separation between altitude blocks is required at or above 5000 feet AGL.

5.2.8.1.2. A minimum of 500 feet vertical separation between altitude blocks is required below 5,000 feet AGL.

5.2.8.1.3. For helicopter versus helicopter, a minimum of 200 feet vertical separation is required.

5.2.8.2. Aircraft may not transit or enter the altitude or altitude block of any adversary unless at least one of the following conditions apply:

5.2.8.2.1. Adversary is beyond 10 nm.

5.2.8.2.2. Adversary is within 10 nm, but not a conflict (i.e., no collision potential) based on situation awareness (SA).

5.2.8.2.3. Visual contact is established on all aircraft in the group of interest.

5.2.8.2.4. Fighter verbally confirms adversary's hard altitude and maintains vertical separation.

5.2.8.3. Determine positive lateral separation by geography, through timing, through onboard systems, or by GCI or AWACS.

5.2.8.4. Each participant must use "see and avoid" techniques to ensure a clear flight path, especially while entering and exiting engagements. Aircrews must use every aid available to clear the area. If during visual setups loss of visual or tally occurs, establish positive separation until regaining visual contact. Any attacker losing sight will maneuver away from the defender's last known position. Defenders will maneuver predictably if loss of sight and SA occurs. Only when the attacker can ensure separation from trailers within a formation, can the attacker perform rear quarter attacks against the leaders of a lead-trail formation. In high aspect multi-bogey merges, pilots must assume that adversaries do not see their aircraft and may maneuver in an unpredictable manner. In addition, aircrew must be aware that opposing aircraft may be maneuvering in response to an aircraft other than their own.

5.2.8.5. Aircrew cannot rely on altitude blocks to guarantee separation once any participant initiates visual maneuvering. After a "TERMINATE" or "KNOCK-IT-OFF" call, all participants will return to assigned altitude blocks while clearing their flight paths.

5.2.8.6. Establish and maintain a minimum of 1,000 feet (500 feet if below 5,000 AGL) altitude separation from other friendly aircraft or friendly flights within 10 nm unless SA allows, or the flights deconflict attacks by space or time.

5.2.8.7. Attackers will prepare for defenders to release countermeasures at anytime when operating with chaff, flare, or Smokey Devil environment. The possibilities of aircraft and chaff, flare, or Smokey Devil collision increase significantly as the attacker approaches gun range. Avoid six o'clock approaches.

5.2.8.8. When two aircraft approach head-on, each will clear to the right unless maneuvering to do so would result in crossing flight paths. Aircraft with the higher nose position will attempt to go above the opponent if energy state and altitude permits.

5.2.8.9. Attackers will cease weapons employment (actual or simulated) under the following conditions:

5.2.8.9.1. Pure pursuit head-on missile attacks prior to 9,000 feet slant range (3000 feet for helicopter versus helicopter). Maneuver aggressively to deconflict flight paths so as not to violate minimum range.

5.2.8.9.2. Any gun attack exceeding 135 degrees aspect (except fighter vs. helicopter engagements where all participants are briefed and remain in their blocks).

5.2.8.9.3. Target aircraft begins an Air-to-Surface delivery maneuver below 5000 feet AGL or employing live ordnance.

5.2.9. Single-Ship Operations. Air-to-Air qualified flight leads may fly single-ship Air-to-Air training missions according to paragraph 3.2.2. Pilots who are not Air-to-Air flight lead qualified, may fly single-ship Air-to-Air training missions according to paragraph 3.2.2. and the following restrictions:

5.2.9.1. Single-ship operations are briefed as a primary or alternate mission.

5.2.9.2. The pilot is Combat Mission Ready (CMR) or Basic Mission Capable (BMC). Initial Qualification Training (IQT)/Mission Qualification Training (MQT) aircrew require an instructor or squadron supervisor on board the aircraft.

5.2.10. Visual Engagements. No more than eight aircraft may participate in the same visual engagement.

**5.3. Bomber Aircraft Training Rules.** This section applies to all echelons of participating commands and to all agencies under the operational control of HQ ACC. In addition, these procedures apply to other services and foreign services with joint training agreements. The information and TRs in this chapter apply with the following exceptions and additions:

5.3.1. Special Procedures: Only conduct Air-to-Air training with armed aircraft (bomber or fighter) under the following guidelines:

5.3.1.1. The participants' wing or group commanders approve the training.

5.3.1.2. Fighter aircrews will be CMR or BMC.

5.3.1.3. Fighters will adhere to the live Air-to-Air ordnance TRs in this chapter.

5.3.2. Training Rules:

5.3.2.1. Minimum range during operations with bomber aircraft is 1000 feet or MAJCOM and service minimum, whichever is greater.

5.3.2.2. Fighter aircrews undergoing mission qualification training (MQT) will only participate in Air-to-Air training with bombers when with a supervisor, flight lead, or instructor.

5.3.2.3. The maneuvering category for bomber aircraft during all fighter activity will be UNLIMITED, except when restricted by paragraph 5.2.7. or the following criteria:

5.3.2.3.1. Defensive maneuvers will not exceed aircraft limitations for speed, altitude, and bank angle.

5.3.2.3.2. During operations at or below 500 feet AGL maximum bank angle is 30 degrees.

5.3.2.3.3. Without full azimuth detection and display capability of fighter aircraft, bomber maneuvering category will be LIMITED.

### 5.3.3. Ground EA Environment Exercise.

5.3.3.1. A Ground EA Environment Exercise provides joint aircrew and ABM/WD training in a simulated threat environment. The training involves Region/Sector Air Operations Centers (RAOC/ SAOC) directing intercept aircraft against bomber aircraft that are employing EA techniques to defeat the intercept. The exercise includes both EA and Air-to-Air training, and may be conducted in conjunction with each other or individually within a designated Training Area (TA).

5.3.3.1.1. With clearance from the RAOC/SAOC, the bomber may employ maximum electronic countermeasures against ground based EW/GCI, acquisition, or communications covering a designated TA. Dispense chaff, during the training period, only when the RAOC/SAOC coordinates and approves a chaff clearance.

5.3.3.1.2. The radar facility may employ any or all EP techniques, fixes, and equipment to counter EA activity within authorized frequency bands, within scheduled mission restrictions, and according to CJCSM 3212.02, *Performing Electronic Attack in the US and Canada for Tests, Training, and Exercises* (applies to CONUS employment only).

5.3.3.1.3. Bomber aircrew will contact the RAOC/SAOC controlling the TA, 15-45 minutes before the IP. See [Attachment 5](#) for coordination information.

5.3.3.1.4. After positive identification and handover from ATC to the controlling agency, the ABM/WD will vector bomber aircraft within the assigned airspace for the duration of the training period. To maximize use of all training aircraft, use IFF and SIF positive target control (PTC) programs. This system provides discrete tracking and improved safety control of adversary aircraft in the radar environment, regardless of EA degradation to search and HF radars. Primary responsibility for safety rests with the controlling agency. Disregard the PTC requirement only when not conducting EA activity against the control facility.

5.3.3.1.5. Drop chaff according to procedures in CJCSM 3212.02, ACCI 11-456 and this instruction. The RAOC/SAOC authorizing chaff and flare drops will record time and call sign of the aircraft receiving the clearance (applies to CONUS employment only).

### 5.3.3.2. Communications:

5.3.3.2.1. The bomber aircrew is responsible for notifying the RAOC/SAOC if there is an air abort, or any changes from the planned IP or IP times.

5.3.3.2.2. The bomber unit command post must notify the RAOC/SAOC concerned of changes if there is a ground abort.

5.3.3.2.3. The RAOC/SAOC responsible for activity will notify the remaining participants or units, of all cancellations or ground aborts,

5.3.3.2.4. Conduct FAA and ICAO communications on UHF when possible. Use FAA and ICAO HF communications when out of UHF range, and use USAF HF aeronautical stations according to FLIP.

5.3.3.3. EA Clearances:

5.3.3.3.1. Make EA notifications and clearance according to CJCSM 3212.02 and ACCI 11-456. Bomber aircrews will contact a RAOC/SAOC to obtain clearance to conduct electronic warfare training. Except for joint exercises and evaluations where blanket EA clearances are pre coordinated, obtain specific chaff clearance when requesting EA clearance. Confirm chaff clearance even when chaff has been pre-coordinated. This clearance does not relieve the aircrew of the responsibility to obtain other clearances required by CJCSM 3212.02.

5.3.3.3.2. If the radar facility called does not have air defense jurisdiction, over the requested area, for the EA clearance, it will request conduction of the EA activity to the appropriate radar facility.

5.3.3.3.3. Relay confirmation of the EA clearance and permission to conduct the EA activity to the aircrew requesting the activity.

5.3.3.3.4. A restricted geographical area clearance as defined in CJCSM 3212.02 does not constitute authority to conduct in-flight EA until obtaining a clearance from the appropriate radar facility.

5.3.3.3.5. CJCSM 3212.02 designates all reference to EA frequency bands and channels in the conduct of electronic warfare operations.

5.3.3.4. Scheduling. For day-to-day training activity use direct coordination between ACC, AFRES, and ANG wings or groups and participating air defense regions, sectors, squadrons, and wings. Coordinate special missions with NAFs and air defense regions/ sectors for scheduling and coordinating training.

**5.4. Airlift Aircraft Training Rules.** This section applies to all echelons of participating commands and to all agencies under the operational control of MAJCOMs with airlift aircraft. In addition, these procedures apply to joint training agreements with other services and foreign services. The provisions of this chapter apply with the following exceptions and additions:

5.4.1. Training Rules:

5.4.1.1. Minimum range during operations with airlift aircraft is 1,000 feet or MAJCOM and service minimum, whichever is greater.

5.4.1.2. Weather Criteria and Maneuvering Limits:

5.4.1.2.1. Limit standard airlift formation flights to day/VMC conditions. The maximum maneuvering category is LIMITED. Maximum bank angle is 60 degrees.

5.4.1.2.2. Night. The maximum maneuvering category is RESTRICTED. Maximum bank angle is 45 degrees and no altitude change. Do not conduct night Air-to-Air training against airlift formation flights.

5.4.1.2.3. IMC. Conduct Air-to-Air training in IMC only with RWR equipped airlift aircraft. All aircraft must maintain continuous communications. Limit evasive maneuvering to LIMITED maneuvers with a maximum of 45 degrees of bank and no altitude change. The minimum range for simulated ordnance delivery is 1 nm.

5.4.1.3. Fighter aircrews will be CMR or BMC before conducting Air-to-Air training with airlift aircraft.

5.4.2. Scheduling activity with airlift units. For day-to-day training activity use direct coordination between airlift wings and participating air defense regions, sectors, squadrons, and wings. Coordinate large scale and long duration exercises through MAJCOM/DO. Send requests for Air-to-Air training involving live armament to MAJCOM/DO.

**5.5. Tanker Aircraft Training Rules.** This section applies to all echelons of participating commands and to all agencies under the operational control of MAJCOMs with tanker aircraft. In addition, these procedures apply to joint training agreements with other services and foreign services. AFSOC tanker aircraft will adhere to the procedures in paragraph 5.9. The provisions of this chapter apply with the following exceptions and additions.

5.5.1. General:

5.5.1.1. Accomplish training within special use or ATC sanitized airspace (MOA, restricted area, warning area, ATCAA, etc.)

5.5.1.2. Do not conduct Air-to-Air training against tanker aircraft during IMC conditions.

5.5.1.3. Minimum range during operations with tanker aircraft is 1,000 feet or MAJCOM and service minimum, whichever is greater.

5.5.1.4. Minimum altitude for tanker aircraft is 3,000 feet (5,000 feet at night) above the highest obstacle or terrain within 4 nm of route centerline. Aircrew will compute a hard minimum MSL altitude using the above criteria.

5.5.1.5. Tanker aircraft may operate in the UNLIMITED maneuvering category but will not exceed 45 degrees of bank (30 degrees in cell formation).

5.5.1.6. Fighter aircrews will be CMR or BMC before participating in Air-to-Air training with tanker aircraft.

5.5.2. Composite Force Exercises and Large Scale Training (e.g., Red Flag, Cope Thunder). The following rules apply to Air-to-Air training where more than 10 aircraft are operating in the assigned airspace. During exercises supervised by Det 1 USAF Air Mobility School, delete the following requirements at the discretion of Det 1 USAF Air Mobility School commander.

5.5.2.1. Tanker aircraft will not depart assigned altitude blocks.

5.5.2.2. Restrict maneuvering to level turns, with bank angle limits as specified in paragraph 5.1.5. Once turns are complete, tanker aircraft may descend within their assigned altitude block.

5.5.2.3. An additional crewmember, acting as safety observer, should occupy the IP seat on the KC-135 and the boom operator forward crew seat on the KC-10. Units may delete this requirement at the discretion of the squadron commander.

5.5.3. Small Scale Training (e.g., Composite Force Training exercise, Dissimilar Air Combat Tactics training). The following rules apply to Air-to-Air training where a total of 10 or less aircraft are operating within the assigned airspace.

5.5.3.1. Tanker aircraft may depart assigned altitude blocks according to paragraph 5.2.9.

5.5.3.2. Restrict maneuvering to level turns, with bank angle limits as specified in paragraph 5.5.1.5. Once turns are complete, tanker aircraft may descend to no lower than the minimum altitudes specified in paragraph 5.5.1.4.

5.5.3.3. An additional crewmember, acting as safety observer, should occupy the IP seat on the KC-135 and the boom operator forward crew seat on the KC-10. Units may delete this requirement at the discretion of the squadron commander.

5.5.4. Scheduling Activity With Tanker Units. For day-to-day training activity use direct coordination between tanker wings and participating air defense regions/sectors, fighter wings, fighter squadrons, and air control units. Coordinate exceptions, and requests for Air-to-Air training involving live armament through the appropriate MAJCOM in paragraph 5.7.1.

**5.6. Initial Trainer Aircraft (T-1A/T-37/T-38/T-43) Training Rules.** This section applies to all echelons of participating commands and to all agencies under the operational control of HQ AETC. In addition, these procedures apply to joint training agreements with other services and foreign services. The provisions of this chapter apply with the following exceptions and additions:

5.6.1. Waivers. Request waivers from these procedures through 19AF/DO.

5.6.2. IFF Instructors:

5.6.2.1. The restrictions of paragraphs 5.6.3.2. and 5.6.3.3. below do not apply to T-38 aircraft flown by IFF instructors, upgrading IFF instructors, and other fully qualified IFF pilots.

5.6.2.2. Instructors, upgrading instructors, and other fully qualified pilots of initial trainer aircraft may participate in day, night, and IMC intercept missions provided participation does not impact unit ability to support daily student training.

5.6.3. Training Rules:

5.6.3.1. If fighters will carry live ordnance, initial trainer aircraft may still participate provided the fighters brief/follow the guidance in paragraphs 5.2.5.3. and 5.2.5.4.

5.6.3.2. Initial trainer aircraft will:

5.6.3.2.1. Establish two-way communication with the controlling agency before the intercept.

5.6.3.2.2. Discontinue tactical maneuvering at 10 nm.

5.6.3.2.3. Adhere to LIMITED maneuvering.

5.6.3.3. If positive control is not available for the trainer aircraft, trainers will establish two-way communication with the fighters and fly the briefed, scripted, non-maneuvering profile.

5.6.4. Scheduling. For day-to-day training activity, as well as exercise participation, use direct coordination between AETC wings and participating NORAD regions, sectors, wings, squadrons, and TACS. Complete all coordination before flight. Send an information copy of any fragmentary order involving initial trainer aircraft to 19AF/DOR.

**5.7. Special Ops/Rescue Fixed-Wing Aircraft Training Rules.** This section applies to all echelons of participating commands and to all other agencies under the operational control of MAJCOMs with Special Ops/Rescue fixed-wing aircraft. In addition, these procedures apply to training agreements with other services and foreign services. The provisions of this chapter apply with the following exceptions and additions:

5.7.1. Training Rules:

5.7.1.1. Minimum range during operations with AFSOC aircraft is 1,000 feet or MAJCOM and service minimum, whichever is greater.

5.7.1.2. Do not conduct intercepts on AFSOC aircraft during air refueling operations.

5.7.1.3. Do not conduct IMC intercepts on helicopters or any aircraft formation.

5.7.2. Scheduling. For day-to-day training activity use direct coordination between AFSOC units and participating wings or squadrons.

**5.8. Helicopters Training Rules.** This paragraph applies to all echelons of participating commands and to all agencies under the operational control of MAJCOMs with rotary wing aircraft when at least one helicopter is participating in Air-to-Air training. In addition, these procedures apply to other services and foreign services with joint training agreements.

5.8.1. Training Rules:

5.8.1.1. Aircraft Separation:

5.8.1.1.1. Assign hard altitudes or altitude blocks to provide vertical separation for non-visual setups. A minimum of 500 feet vertical separation is required between altitudes or blocks between fighters and helicopters (200 feet between helicopter altitudes or blocks).

5.8.1.1.2. Minimum range during all Air-to-Air training between fighters and helicopters is 1000 feet. Minimum slant ranges during all Air-to-Air training between helicopters only is 500 feet (200 feet minimum for pre-briefed tail chase maneuvers during BHM sorties).

5.8.1.1.3. Aircraft may not enter or transition the altitude or block of an adversary unless one of the following conditions apply:

5.8.1.1.3.1. Adversary is beyond 10 nm (5 nm for helicopter vs. helicopter).

5.8.1.1.3.2. Adversary is within 10 nm (5 nm for helicopter vs. helicopter), but not a conflict (i.e., no collision potential) based on situational awareness.

5.8.1.1.3.3. Establishing visual contact on all aircraft in the group of interest.

5.8.1.1.3.4. Helicopter and/or fighter confirm adversary's hard altitude and maintains required vertical spacing.

5.8.1.2. Maneuvering Categories:

5.8.1.2.1. UNLIMITED. No restrictions except AFI 11-2MDS series and aircraft T.O.s.

5.8.1.2.2. LIMITED. LIMITED maneuvering is the maximum category for helicopter during night Air-to-Air and surface-to-air threat reactions. Maneuver restrictions in paragraph 5.2.7.2. apply with the following exception: vertical jinking maneuvers are permissible during a defensive turn down to 100 feet AGL. Immediately before and after defensive/evasive reactions altitude will be according to AFI 11-2MDS series guidance.

5.8.1.3. Maneuvering Limitations:

5.8.1.3.1. Day. The bulk of helicopter-versus-fixed-wing Air-to-Air defensive maneuvering training should normally occur in day VMC conditions and will adhere to the weather minimums in paragraph 5.2.8.2.3. Helicopter versus helicopter Air-to-Air engagements will adhere to the following weather minimums:

5.8.1.3.1.1. 1000 feet vertical and 1 nm horizontal cloud clearance

5.8.1.3.1.2. 3 nm (5 km USAFE) visibility

5.8.1.3.1.3. Discernible horizon

5.8.1.3.2. Night. All night defensive maneuvering training will be LIMITED maneuver category and will comply with the appropriate AFI 11-2 MDS series weather and altitude minimums.

5.8.1.3.3. Fighter aircraft will remain subsonic during training conducted with helicopters.

5.8.2. Live Weapons Employment. During defensive maneuvering training against surface threats, helicopter aircrews must deconflict live weapons employment with flight and supporting aircraft.

**5.9. Joint Air-to-Air Training Rules.** AFJI 36-2220, *Joint USAF/USA/USN/USMC Air Combat Training*, covers Interservice Air-to-Air training requirements.

## Chapter 6

### AIR-TO-SURFACE TRAINING

**6.1. Introduction.** This chapter describes procedures for tactical Air-to-Surface training. Use the procedures in this chapter along with operational command directives, ATC regulations, and letters of agreement. These weapons employment procedures provide aircrews and TACs typical procedures for weapons employment under fixed conditions. For additional FTU or MQT restrictions and termination rules see paragraph **6.3.8**. Find further procedures for formal course training in the applicable syllabi. For Special Operations and mobility Air-to-Surface operations, follow the guidance in this chapter and AFI 11-2MDS Volumes 1 and 3, AFI 13-217, AFI 11-231, and AFTTP 3-3s for training restrictions and other guidance. When this AFI conflicts with the guidance found in other AFIs, follow AFI 11-2MDS Volumes 1 and 3, AFI 13-217, and AFI 11-231. During composite air operations, MAF aircrews will thoroughly brief other participants concerning the differences between their operating procedures and this AFI.

#### 6.1.1. Air-to-Surface Training Missions:

6.1.1.1. Perform all delivery passes (including jettison passes), whether hot or dry, using live ordnance delivery parameters to include fuse arming, safe escape, safe separation, and flight deconfliction considerations.

6.1.1.2. Avoid populated areas when carrying heavy-weight ordnance.

6.1.1.3. When conducting simulated attacks against off-range or manned targets, with expendable ordnance loaded on the aircraft, confirm arming switches in the OFF, SAFE, SIM, or equivalent positions. Refer to aircraft AFI 11-2MDS series regulations for specific switch settings for aircraft and cockpit configurations. Select off-range targets so that an inadvertent release will not endanger life.

#### 6.2. Authorized Employment Patterns:

6.2.1. Class A Range. Flights will fly the same delivery pattern (rectangular, pop attacks, etc.); however, aircrews may mix events or delivery modes when using the same target, same type delivery, and if approved by the Range Control Officer (RCO). Fly radio-silent attacks, random attacks, element tactics, split pop-up attacks, etc., only if allowed by range procedures, if prebriefed, and if approved by the RCO.

#### 6.3. Air-to-Surface Training Rules. See paragraph **6.5** for additional night rules.

##### 6.3.1. Weather Minimums (AFSOC aircraft refer to MAJCOM guidance):

6.3.1.1. Aircraft operating with a TF radar will use the range specific weather minimums or minimums according to AFI 11-2MDS series instructions, whichever are greater.

6.3.1.2. The ceiling must be at least 500 feet above the highest portion of the bombing pattern or according to AFI 11-2MDS series aircraft regulations, whichever is higher.

6.3.1.3. Visibility will be at least 3 nm (5 KM USAFE).

6.3.1.4. Daylight bombing events on over water ranges requires a discernible horizon.

##### 6.3.2. Range Entry:

6.3.2.1. Perform a dry-clearing pass before weapons delivery on Class B/C ranges to ensure the target area is clear of unauthorized persons or vessels. Positively identify and clear (visually and/or with sensors) the target area for a minimum of 30 seconds before weapon release. Omit the requirement for the dry-clearing pass if other means can confirm the range is clear (e.g., range personnel, FAC/TAC, IG chase aircraft, a departing flight, etc.). Accomplish a dry pass when an aircrew has not been on that range for more than 1 year, and/or wants to be refamiliarized with the range. See paragraph 6.5.1.5. for additional night restrictions and paragraph 6.8.2.3. for additional joint live fire restrictions.

6.3.2.2. Range entry does not require a spacer pass; however, if performed, make the spacer pass at an altitude (500 feet AGL minimum) appropriate for target surveillance.

6.3.3. Range pattern operations are limited to a maximum of four attacking aircraft at any one time.

6.3.4. Single-Ship Operations. See paragraph 3.2.2. for additional restrictions.

6.3.4.1. Aircrews may fly single-ship Air-to-Surface training with the following restrictions:

6.3.4.1.1. Class A Ranges. CMR and BMC aircrew may perform single-ship conventional (to include pop attacks) and nuclear deliveries. MQT aircrew may perform single-ship conventional and nuclear deliveries only if there is an instructor or squadron supervisor on board the aircraft.

6.3.4.1.2. Class B/C Ranges or Off-Range Simulated Deliveries:

6.3.4.1.2.1. CMR/BMC aircrew or MQT aircrew with an instructor or squadron supervisor in the aircraft may perform LATN and single-ship level, climbing, or diving deliveries. Minimum altitude for diving deliveries is 4,500 feet AGL.

6.3.4.1.2.2. CMR and BMC aircrew may perform single-ship medium altitude Maverick attacks above 5,000 feet AGL. When using TFR/LANTIRN systems, CMR and BMC aircrew may perform single-ship Maverick attacks at all altitudes. MQT aircrew may perform single-ship Maverick attacks only if there is an instructor or squadron supervisor on board the aircraft.

6.3.4.2. To preclude landing with live or inert heavyweight ordnance, aircrews may fly a single-ship mission to an appropriate range and release ordnance on one, non-tactical pass.

6.3.5. Switch Changes. Range restrictions and tactics permitting, change cockpit switches in wings level flight before the final attack heading.

6.3.6. Minimum Altitudes. See paragraph 6.5. for additional night minimums.

6.3.6.1. Determine minimum release and recovery altitudes by using the fuzing and fragmentation envelopes established in aircraft specific weapons delivery T.O.s, AFI 11-2MDS series guidance, or this instruction, whichever is higher.

6.3.6.2. In addition to the minimum altitudes established in AFI 11-2MDS series guidance, apply the following minimum altitudes:

6.3.6.2.1. Level Deliveries: 200 feet (50 feet for helicopters).

6.3.6.2.2. LAHD: 300 feet on a Class B/C.

6.3.6.2.3. Nuclear and Radar Events: 200 feet.

6.3.6.2.4. Low Angle Strafe/Long Range Strafe/Two Target Strafe (LAS/LRS/TTS): 75 feet.

6.3.6.3. Pilots will not descend below their designated low-level category at any time (for example, conventional downwind, approach to a pop-up point), except during final approach for low angle bombing, level bombing, and low angle strafe attacks.

6.3.6.4. For nuclear weapons delivery patterns, use a minimum of 1,000 feet AGL on downwind except when operating with a Terrain Following (TF) or Terrain Avoidance (TA) system.

6.3.7. Abort Criteria. Along with the general criteria set in paragraph 3.2.3. (KIO and Terminate Procedures), cease fire and/or abort the pass and do not release if any of the following situations occur:

6.3.7.1. If friendly troops and/or FAC/TAC position near target area is inside the distance restrictions (see paragraph 6.8.1.6.).

6.3.7.2. If over water and the discernible horizon or the land-water contrast is lost (except when operating helicopters or aircraft with a TF or TA systems).

6.3.7.3. If unable to positively identify the target. Note: Each aircraft's specific regulations define the requirements for identifying a target when using offsets.

6.3.7.4. If the aircraft passes below the minimum recovery altitude established in AFI 11-2MDS series guidance, this chapter, or the planned minimum altitude for the event being flown.

6.3.7.5. If unsatisfactory entry or release conditions exists. Note: Abort the pass if the actual dive angle exceeds the planned dive angle by more than 5 degrees (10 degrees if the planned recovery altitude is above 10,000 feet AGL).

6.3.7.6. If airspeed drops below minimums specified in appropriate AFI 11-2MDS series regulations.

6.3.7.7. (For A/OA-10 aircraft) If aircraft is 3000 feet slant range from a hard target during LAS, and/or if aircraft will pass within 500 feet of the hard target or aircraft will pass either target's 3-9 line during TTS.

6.3.8. FTU and MQT Restrictions and Termination Rules:

6.3.8.1. Students will not change targets once initiating roll-in to final.

6.3.8.2. Pop-up Restrictions. FTU and FTS students will observe the following restrictions unless an instructor is on board the aircraft. MQT aircrews will observe the following restrictions unless an instructor is in the flight and able to monitor the pattern:

6.3.8.2.1. Terminate a pop-up attack if the actual pull-up point is inside the planned pull-up point.

6.3.8.2.2. Do not perform pop-up attacks from fighting wing or closer position.

6.3.8.2.3. Terminate the pass if the roll-in will require less than 15 degrees or more than 90 degrees of turn.

6.3.8.3. LANTIRN students will only fly direct pop attacks when engaged in syllabus directed training missions.

6.3.9. Weapons Delivery Spacing:

6.3.9.1. Use the following minimum spacing on final during level or climbing deliveries with training ordnance:

6.3.9.1.1. Level - Minimum formation deconfliction spacing time for the ordnance simulated or 15 seconds, whichever is greater.

6.3.9.1.2. Climbing - 30 seconds.

6.3.9.1.3. When subsequent aircraft conduct a delivery that requires target overflight following a climbing delivery by a preceding aircraft, use bomb time-of-fall from release plus 30 seconds to ensure the subsequent aircraft crosses the target after bomb impact.

6.3.9.2. Use T.O. 1-1M-34 to determine minimum spacing when employing live ordnance.

6.3.10. Fouls:

6.3.10.1. Assess a foul for any of the following reasons:

6.3.10.1.1. Violation of flight or range safety.

6.3.10.1.2. If an aircraft passes below the minimum recovery altitude as established in AFI 11-2MDS series instructions or this instruction for the event being flown.

6.3.10.1.3. An unintentional double-firing burst versus a single target or strafing past the foul line.

6.3.10.1.4. A lazy recovery from a strafe pass.

6.3.10.2. Aircrews will not perform further deliveries after receiving a second foul on the range or a single dangerous foul, or as determined by the RCO or flight leader

6.3.11. Last Strafe Pass Procedure. The last strafe pass will be dry unless each aircraft accomplishes an escape maneuver and an immediate turn after recovery. If performing a dry pass, check switches in SAFE, SIM, OFF, or equivalent position before initiating the last pass.

6.3.12. Armament Safety Procedures:

6.3.12.1. After completing weapon deliveries, flight leads will reform their flights and obtain an armament safety check from each flight member.

6.3.12.2. If unable to confirm ordnance expenditure (including night illumination flares) on the range, perform a visual bomb check. The aircrew, RCO, FAC/TAC, B-1 Stores Management System (SMS), or another flight member can all confirm ordnance expenditure. If visual confirmation is not feasible (for example, night without NVGs), follow hung ordnance procedures.

6.3.13. Recovery From Delivery. Execute recoveries from weapons deliveries according to safe escape maneuvers described in the Dash 34 or Dash 25 aircraft specific T.O.s. Recoveries will observe minimum altitudes consistent with safe escape, fuze arming, and the weapon delivery minimum altitudes established in AFI 11-2MDS series guidance and this instruction. Turning maneuver safe escapes resulting in a descending turn are not authorized.

6.3.14. Flight Composition. A tactical unit possessing dissimilar fighters with integrated missions (e.g., SEAD aircraft, buddy lasing, etc.) may employ as mixed elements when tactically sound.

6.3.15. Release Authority. Only a fully qualified Range Control Officer on a Class A range is authorized to allow ordnance release. A TAC, Joint TAC or flight lead is authorized to allow ordnance release on Class B or C ranges.

**6.4. Range Radio Procedures.** See paragraph 6.5. for additional night radio procedures.

6.4.1. Radio Contact. Do not expend ordnance on a Class A or Class B/C manned range without two-way radio contact with the RCO or TAC on duty. Aircrew will acknowledge all transmissions by the RCO or TACP.

6.4.2. Range Entry. Before weapons delivery on a Class A range (or when using scoring on a Class B range), flight leaders will confirm the lineup and events. The RCO will confirm range, traffic pattern (when applicable), altimeter setting, and strafe panel (when applicable). The flight lead will read back the applicable range, traffic pattern, altimeter setting, and strafe panel. Flight members acknowledge with callsign (e.g., "Viper 21, Right Range, Left Traffic, 29.92," "2," "3," "4").

6.4.3. Class A Range Standard Radio Calls:

6.4.3.1. Conventional:

6.4.3.1.1. "Call Sign, BASE."

6.4.3.1.2. "Call Sign, UP" (pop-up patterns only).

6.4.3.1.3. "Call Sign, IN" and add "Dry" if appropriate. Abort the pass without clearance to drop ordnance.

6.4.3.1.4. "Call Sign, OFF, DRY" if applicable.

6.4.3.2. Nuclear patterns and conventional bomber racetrack patterns:

6.4.3.2.1. "Call Sign, BASE."

6.4.3.2.2. "Call Sign, FINAL (Event)."

6.4.3.2.3. "Call Sign, OFF HOT or DRY."

6.4.4. Modify radio calls on a Class B or C ranges to suit the tactical situation (for example, communications jamming).

**6.5. Night Surface Attack Procedures.** See paragraph 3.3. for additional procedures.

6.5.1. Night Weapons Delivery Patterns. At night observe the following additional requirements:

6.5.1.1. Turn position lights to full intensity, and the anti-collision light (strobe) on unless NVG-equipped. NVG aircraft operating in designated airspace may use lighting options IAW AFI 11-202, Vol 3.

6.5.1.2. If conducting training with an RCO/TAC, the RCO/TAC must have an illumination device to make his/her position readily discernible to NVG-equipped aircraft. NVG aircraft will use external lighting that allows the RCO or TAC to observe the aircraft in the pattern. If aircraft are employing covert or lights out, the RCO/attack controller will be properly equipped and trained with NVGs.

6.5.1.3. Minimum in-flight visibility for visual attacks is 5 nm (2 nm for rotary wing aircraft).

6.5.1.4. Illuminate the target area with airborne flares or ground marking devices. Night radar bombing, LANTIRN, F-117, Pave Penny, IR Maverick attacks, NVG, or B-52 STV/ FLIR aircraft do not require artificial illumination of the target (see paragraph 6.5.3.). However, NVG-equipped aircraft may require artificial illumination if the flight lead deems existing lighting conditions are insufficient.

6.5.1.5. Night Class B/C Dry Clearing Pass. Aircrews may perform a combination first run attack, range clearing pass only during a level delivery above 2,000 feet AGL or 1,000 feet AGL for NVG-equipped aircraft.

6.5.1.6. Operate no more than three aircraft, (or four FLIR or NVG-equipped aircraft) using either an A/A TACAN or A/A radar in the same racetrack or conventional pattern. All racetrack and conventional patterns will provide adequate spacing to allow aircrews to focus primarily on aircraft control vice aircraft deconfliction.

6.5.1.7. The minimum altitude is 1,000 feet AGL or the MSA, whichever is higher, unless operating under a Terrain Following (TF)/Terrain Avoidance (TA) system.

6.5.1.8. Adjust sight settings and switch positions that require heads down only action when wings level and on downwind.

6.5.1.9. Aircrews will not attempt to air score own-ship deliveries.

6.5.1.10. Continuously monitor flight instruments due to depth perception and altitude/attitude perception difficulties.

6.5.1.11. Aircrews conducting night/limited visibility Air-to-Surface missions with RCO/TAC must be in positive communications with RCO/TAC. When LTDs are employed, the RCO/TAC must hear "Spot" meaning the aircraft has acquired laser energy. When IR pointers are employed, the RCO/TAC must further hear "Visual" meaning TAC's position is positively identified and "Tally Target" meaning the aircraft has positive target identification.

#### 6.5.2. Night Visual Weapons Delivery Pattern (N/A for helicopters):

6.5.2.1. Maximum planned dive angle is 45 degrees.

6.5.2.2. Minimum altitude on downwind is 1,500 feet AGL or the MSA whichever is higher.

6.5.2.3. Aircrews not utilizing TFR will begin their recoveries to ensure that their aircraft does not go below the following minimum altitudes:

6.5.2.3.1. 4,500 feet AGL for planned dive angles more than 35 degrees.

6.5.2.3.2. 2,000 feet AGL for planned dive angles between 35 and 20 degrees.

6.5.2.3.3. 1,000 feet AGL for planned dive angles of 20 degrees or less.

#### 6.5.3. Night System Weapons Delivery Pattern:

6.5.3.1. A "Night System" is a device that allows the aircrew to identify the target when normal visual acquisition is not possible.

6.5.3.2. LANTIRN-equipped, F-117 aircraft, NVG-equipped, and B-52 STV/FLIR aircraft may fly events on class A, B or C ranges.

6.5.3.3. Minimum altitude on downwind is either 1,500 feet AGL or 1,000 feet AGL for FLIR equipped aircraft, or TA or TF limits. Descend to release altitude when established on final. Bombers may operate at AFI 11-2MDS-Series Vol. 3 series altitudes if range operating procedures allow.

6.5.3.4. Minimum spacing between deliveries is 60 seconds. LANTIRN or NVG equipped aircraft may use daylight rules of minimum spacing when operating with an A/A TACAN or an A/A radar.

6.5.3.5. Minimum airspeed during low altitude loft deliveries is 300 KIAS (210 KIAS for A/OA-10) or AFI 11-2MDS series minimum, whichever is greater, as authorized by AFI 11-202 Volume 3, paragraph 5.7.5..

6.5.3.6. Maximum angle of bank during LANTIRN recovery maneuvers from a loft or climbing safe escape is 135 degrees. Descend no lower than MSA until within TF limits.

#### 6.5.4. Night Illumination Flare Procedures:

6.5.4.1. Computations. Mission requirements and effects desired will dictate criteria used. Plan the minimum altitude for flare release to ensure flare burnout before ground impact.

6.5.4.2. Class A Range Radio Procedures. Flare aircraft will use the call sign "Flareship" in all range radio calls regardless of the pattern flown. Use the following radio calls:

6.5.4.2.1. "FLARESHIP, DOWNWIND."

6.5.4.2.2. "FLARESHIP, BASE."

6.5.4.2.3. "FLARESHIP, IN."

6.5.4.2.4. "FLARESHIP, OFF, (Number) FLARES AWAY."

6.5.4.2.5. "Call Sign, IN, FLARESHIP IN SIGHT," is a required call by aircraft conducting a weapons delivery when a flareship is flying a different pattern from the weapons delivery pattern. Aircraft will abort the pass if the flareship is not in sight.

6.5.4.3. Class B and C Range radio procedures are same as day (see paragraph 6.4.4.).

6.5.4.4. Dud Flare Procedures. If a dud flare is suspected, cease range operations until the flare is no longer a hazard.

6.5.4.5. Determining Flare Release Points. Determine the release point by a FAC/TAC, radar vector, dead reckoning, or by the RCO. If position is uncertain, do not attempt a flare release.

6.5.4.6. Flare Patterns. Flare patterns and procedures are variable. The flight will approach the target on the weapons delivery heading at the flare pattern altitude and airspeed, or according to local range procedures. Timing during the flight break-up must position the first delivery aircraft on the downwind leg as the flareship releases flares. Make flare drop and ordnance deliveries in any logically prebriefed sequence that provides continuous illumination of the target area.

6.5.4.7. Flare Support Aircraft Coordination. Establish positive coordination between flare support aircraft, weapons delivery aircraft, and RCOs to ensure a mutual understanding and knowledge of the overall operation. Specific briefing items will include:

6.5.4.7.1. Range entry, exit, and deconfliction procedures.

6.5.4.7.2. Pattern altitude and direction.

6.5.4.7.3. Expected number of flares dropped on each pass for each different event.

6.5.4.7.4. Dud flare procedures.

## **6.6. Live Ordnance Procedures:**

6.6.1. Do not select live ordnance stations until within range boundaries and ready for delivery. Do not arm delivery systems unless there is intent to expend and according to range procedures.

6.6.2. Following all live ordnance deliveries accomplish a bomb check and battle damage check at the earliest opportunity.

6.6.3. Maverick Employment:

6.6.3.1. If multiple elements are in the formation, non-firing elements will maintain a position clear of the firing element and/or stacked high.

6.6.3.2. If missile launch has not occurred before minimum range, abort the pass.

**6.7. Operations with Naval Ships.** The following additional rules apply during maritime training when not covered by published joint exercise SPINS. For helicopter shipboard operations, refer to JP 3-04.

6.7.1. The following restrictions govern flight in the proximity of non-participating ships:

6.7.1.1. Do not penetrate a 1 nm bubble vertically or horizontally.

6.7.1.2. Do not fly more than two aircraft in the immediate vicinity.

6.7.1.3. Do not perform any provocative or aggressive acts, or any acts reasonably perceived as provocative or aggressive.

6.7.1.4. Do not expend ordnance within 10 nm.

6.7.1.5. Limit uses of a nonparticipating surface ship to navigation practice setups only. Do not use nonparticipating surface ships with heavyweight ordnance on board.

6.7.2. Rules during training with participating ships must be according to prebriefed naval SPINs for the ships concerned. In no case will aircraft penetrate a 500-foot bubble around exercise ships.

6.7.3. During multiple sector attacks, maintain a 1,000 foot minimum altitude differential between converging single aircraft. Maintain a 2,000 foot differential between converging elements.

6.7.4. A maximum of two aircraft will engage in near simultaneous attacks (10 seconds minimum spacing) on the same target. The second aircraft must maintain visual contact.

6.7.5. A maximum of four aircraft can attack a single target with a minimum of 20 seconds between elements.

6.7.6. A maximum number of eight aircraft can attack a simulated Surface Action Group (SAG) of two or more targets simultaneously.

6.7.7. The minimum distance between simulated SAG targets is 1 nm for simultaneous attacks.

6.7.8. Aircrews will not attack targets outside their prebriefed attack quadrant.

6.7.9. Aircrews will not attack into reflected sunlight.

6.7.10. An in-flight heading check is mandatory upon initiating recovery from maritime training.

## **6.8. Close Air Support (CAS)/FAC/TAC Live Fire Guidance:**

### **6.8.1. General:**

6.8.1.1. During joint live fire operations (i.e., activity involving members of another service in which objects or projectiles are dropped, fired, or expended from an aircraft), careful planning and execution are required by all participants. Joint Publication 3-09.3, *Joint Tactics, Techniques, and Procedures for Close Air Support*, and AFTTP 3-1, Volume 26, *Theater Air Control System*, and AFTTP(I) 3-2.6, J-FIRE, *Multi-service Procedures for the Joint Application of Firepower* provide further guidance and will be used in conjunction with this instruction.

6.8.1.1.1. Detailed planning for joint live fire exercises will be accomplished by, or under the supervision of the senior FAC/TAC experienced in joint live fire exercises. NOTE: Experience is defined as having actively participated in the planning and execution of a previous joint live fire operation.

6.8.1.1.2. Planning and coordination will include working with the appropriate Service representative for compliance with their regulations. All members will be fully briefed on the training area, target(s) location and description, attack parameters, location and planned movement of troops and aircraft, approved alternate targets, planned ground fire, airspace control measures (ACMs) (phase lines, restricted fire areas, etc.), abort criteria and procedures, emergency jettison procedures and areas, range restrictions, ordnance fans and ordnance discipline (e.g., weapon footprint, safe distances, arming criteria, etc.) IAW applicable directives.

6.8.1.1.3. Units will use their assigned Ground Liaison Officers (GLOs) in their mission briefings to provide Service training objectives and tactical situation information. Units without GLOs will obtain Service training objectives and tactical situation information from the participating Service unit's TAC.

6.8.1.2. Only aircrews/FACs/TACs that are CMR or BMC will participate in joint live fire operations.

6.8.1.2.1. During mission planning the aircrew will confirm with the ground party that a certified TAC will be performing the terminal control(s). If unable to confirm during mission planning, the flight lead will confirm with the ground party during initial check-in, that a certified TAC will be controlling.

6.8.1.3. The FAC/TAC controlling the impact area and supporting fires will ensure positive communications are maintained between all parties. If two-way communication between any party is lost, all ordnance delivery activities will cease until communications are re-established.

6.8.1.4. The TAC will coordinate all fires with the appropriate maneuver and fire support unit prior to commencement of the air strike.

6.8.1.5. An independent safety observer with two-way radio communications is required during peacetime operations. The safety observer must be a TAC in a position to observe the target and attacking aircraft, with full abort authority and responsibility to ensure the safety of ground personnel, and that the correct target is attacked. The use of a safety observer is a peacetime requirement intended to enhance safe operations, not to restrict properly executed CAS/Joint Air Attack Team (JAAT) operational procedures. Some munitions and attack restrictions may be employed

that do not allow the safety observer to observe target and/or aircraft. In these cases, an independent safety observer using an (maneuver commander) approved automated ground and air forces tracking system (e.g., Solaris, AWMDS) with two-way communication to all players fulfills this requirement. Refer to paragraph 6.8.3. for operations with Stand-Off/GPS-guided/coordinate dependent weapons.

6.8.1.6. In the absence of established local range restrictions, the controlling TAC/FAC(A) will use the appropriate munitions safety fans based on the type of munitions, release parameters, terrain, and aircraft platform.

6.8.1.6.1. Minimum safe distances of personnel from ordnance impact areas will comply with AFI 13-212, Vols. 1 and 3. Specifically, neither the weapons safety footprint nor the aircraft flight path will overlay manned sites for live ordnance delivery. JP 3-09.3, JTTP for CAS, contains Risk Estimate Distances are for combat use. For peacetime operations, see appropriate service guidance.

6.8.1.6.2. At no time will strafe or inert ordnance be employed closer than 500 meters from ground positions and high explosive ordnance (e.g., MK-82) will not be employed closer than 2000 meters where ground forces are at risk from blast, fragmentation, and shrapnel. Consider all relevant factors, including munitions type, terrain, and operational complexity.

6.8.1.7. TACs will wear protective helmets and vests when conducting live fire training with aircraft delivering ordnance or conducting strafing. Helmets and vests must be of the type that will mitigate the effects of fragmentary ordnance associated with aerial delivered weapons. Additionally, any personnel who are observing the training and are collocated with the TAC are also required to wear a helmet and vest. Under extraordinary circumstances, unit commander may waive this requirement on a case-by-case basis.

6.8.1.8. Refer to [Attachment 8](#), and [Attachment 9](#), "Aircrew and Terminal Attack Controller Coordination Guide" and "CAS Briefing Form (9-Line)" when working with Joint Terminal Attack Controller (JTAC).

#### 6.8.2. Air Strike Control Procedures:

6.8.2.1. Air strikes during CAS/JAAT operations will be controlled by a FAC/TAC exercising CAS Terminal Attack Controls as directed in JP 3-09.3.

6.8.2.2. Troop and target identification is critical. The target will be marked (mandatory for peacetime operations) by a unique terrain feature or marking device (e.g., artillery round, laser, IR pointer, etc.). Exacting measures will be taken to avoid mistaken target identity and to ensure all participants are thoroughly oriented to the specific safety parameters. Aircrew and FAC/TAC need to ensure the exact position(s) of friendly forces near the target area is identified before releasing the weapon(s).

6.8.2.3. The attack aircraft will perform an initial dry pass using the attack parameters, followed by target area and friendly position orientation. After all flight members confirm target area and friendly location(s), the next attack may be performed "HOT." Rehearsals conducted up to 48 hours in advance may count as the initial pass, provided all major participants (aircrew and FAC/TAC) and parameters remain the same.

6.8.2.4. Check-in. Attack aircraft will provide the FAC/TAC with their identification/mission number, number and type of aircraft, position and altitude, ordnance, play time, and abort code.

6.8.2.5. The FAC(A)/TAC will provide the attack aircraft with the 9-Line or theater specific CAS brief. The brief is standardized for use with fixed-wing and rotary-wing aircraft, and is used for all threat conditions and does not dictate the attack aircraft's tactics. Use of standardized briefing sequence improves mission direction and control by allowing TACs to pass information rapidly. The 9-Line briefing also aids aircrews in determining if they have the information required to perform the attack. The attack flight must read back (verbally or digitally) Line 4 (elevation), Line 6 (coordinates), and any "restrictions" IAW JP3-09.3. The TAC must verbally acknowledge the read-back. CAS briefing and confirmation of friendly/TAC location requirement applies to initial attack brief for each flight. Subsequent attacks by the same flight may not require complete CAS briefing. Coordinate-dependant, autonomously-guided munitions will always require a complete 9-line brief (e.g., JDAM, JSOW, etc.) See paragraph 6.8.3. for additional Stand-Off/GPS guided weapons.

6.8.2.5.1. FAC/TAC is responsible for assigning hard altitudes or altitude blocks to provide vertical separation or establish positive lateral separation by geography, timing, or through onboard systems. When using altitude deconfliction:

6.8.2.5.1.1. A minimum of 1,000 feet vertical separation between altitude blocks is required at or above 5000 feet AGL.

6.8.2.5.1.2. A minimum of 500 feet vertical separation between altitude blocks is required below 5,000 feet AGL.

6.8.2.5.1.3. CAS aircraft will verbally confirm all altitude restrictions.

6.8.2.5.2. Aircraft will not transit or exit the altitude or altitude block, to include weapons employment, unless cleared by FAC/TAC, and aircraft will maintain visual, geographic, or on-board system deconfliction.

6.8.2.5.3. In addition to on-board systems and the established deconfliction plan, each participant must use "see and avoid" techniques.

6.8.2.5.4. Aircrew will initiate a "TERMINATE" or "KNOCK IT OFF" IAW paragraph 3.3.2. criteria. All participants will cease tactical maneuvering and return to assigned altitude blocks while clearing their flight paths.

6.8.2.5.5. TAC/FAC(A) or an observer locates and identifies the target. Observer may be a ROA, scout, colt FIST, SOF, or other C4ISR assets with real-time targeting information.

6.8.2.5.6. Aircrew crosschecks the target coordinates correlate with the expected target area. Aircrew validates target location by using all available means. These include TAC description of the target area ("talk-on"), target marks by FAC(A) aircraft or ground forces, plotted map location, digital map set displayed target location, HUD symbology, FLIR, Radar, etc.

6.8.2.5.6.1. If the aircrew cannot crosscheck that the coordinates correlate with the expected target area due to target/systems limitation (e.g., no-show targets, etc.), the aircrew will default to the target coordinates given by FAC(A)/TAC and confirms the target coordinates and elevation with the FAC(A)/TAC using target data read off their weapon system display.

6.8.2.6. Target Marking. Target marking aids aircrews in locating the precise target location and it helps reduce the possibility of fratricide. The mark must be timely and accurate. Target marking is mandatory when maneuver forces are within 7.5 km of the target.

6.8.2.6.1. Mark Timing. (refer to JP 3-09.1, JTTP for *Laser Designation Operations*). Infrared pointers and indirect fire munitions marks (except illumination) should appear/impact 30 to 45 seconds prior to ordnance impact.

6.8.2.6.2. Marking Ground Positions. It is mandatory for TACs to mark their location for joint live fire operations with ground personnel or ground maneuver forces within 7.5 km of the target. They can mark their location with night vision devices, smoke, beacon, mini-transponders, signal panels, or mirror. The mark must be clearly understood by the attack aircrew. During night range operations, TACs must place IR lights where aircrew overhead can visually acquire and maintain sight of ground positions. NOTE: TACs must be careful because the IR pointer can also be used to direct the NVG-equipped aircrew to the TAC position. Planning the attack axis with a small offset from the controller's pointer-to-target line can aid the aircrew in confirming and maintaining the controller's position.

6.8.2.7. Terminal controllers will ensure the following:

6.8.2.7.1. TACs are the final switch in the chain of events that ensures mission success or failure. TACs are the range safety officer. TACs must be in position to control the safety aspects of the pass. Ground TACs own the final release clearance authority. If TACs choose to relinquish the final release clearance authority (e.g., to FAC (A), etc.), TACs must ensure that a clear, concise, and positive handoff occurs with a current and qualified air/ground controller.

6.8.2.7.2. TACs will verify that aircraft have positive identification of TACP/other manned positions before initiating target talk-ons or attacks.

6.8.2.7.3. When conducting night CAS with IR pointers, TACs must hear "visual" (meaning terminal controller's position is positively identified) and "tally target" (meaning the aircraft has positive target identification). This procedure will be accomplished on each pass.

6.8.2.7.4. Whenever possible, TACs will ensure CAS aircrews are provided with range photos/diagrams for mission planning and execution.

6.8.2.7.5. TACs will control the mission from planning to debrief. During execution, maintain situational awareness or reset the aircraft back to the IP and regroup.

6.8.2.8. TACs are responsible for the safe conduct of CAS operations; however, any player can abort for safety. All players have the authority and responsibility to call "KNOCK-IT-OFF" or abort the pass if they deem safety to ground crew is in jeopardy. TACs should be conservative, comply with established safety standards, and never hesitate to terminate a scenario to meet peacetime safety requirements.

### 6.8.3. Additional Procedures for CAS Operations with Stand-Off/GPS-Guided/ Coordinate-Dependent Weapons.

6.8.3.1. **General**. To standardize procedures and eliminate confusion, TAC personnel and aircrews will use the following procedures during CAS operations. CAS procedures will continue IAW JP 3-09.3, JTTP for *Close Air Support*, 11-2 MDS Vol 3s and AFTTP 3-1s.

6.8.3.1.1. The terminal controller maintains the responsibility to control the attack including striking the correct target, and is the final authority for weapons release. TAC authority does not override peacetime restrictions.

6.8.3.1.2. The aircrew is responsible for conducting weapon system checks, confirming target data is properly accepted by the weapon, meeting weapon release parameters, and meeting munitions, range, airspace, and theater restrictions. The aircrew transmits the coordinates and elevation that the weapon accepted to the FAC(A)/TAC.

6.8.3.1.3. These weapons can be used with an independent FAC/TAC but will not be integrated into a ground maneuver exercise. The following guidance is required for mission using Stand-Off, GPS-guided, or coordinate-dependent weapons.

#### 6.8.3.2. Final Attack Control.

6.8.3.2.1. TAC/FAC(A) or an observer locates and identifies the target. Observer may be a ROA, scout, COLT, FIST, SOF, or other C4ISR assets with real-time targeting information.

6.8.3.2.1.1. Operations with these types of weapons require highly accurate coordinates and elevation. **Any coordinate format or target location error will reduce the desired weapons effect, result in a larger weapon miss distance, and possibly endanger friendly troops.**

6.8.3.2.1.2. The ability to derive accurate target location and elevation is paramount to mission success. Proper map study/plot combined with the use of laser range finders and associated GPS equipment should be utilized to derive the most accurate coordinates.

6.8.3.2.2. Change to read: Terminal controllers will transmit a complete (9-Line or theater specific) CAS briefing to the attack aircraft (digitally or verbally) on all initial attacks for each flight. Subsequent CAS briefing will be IAW JP3-09.3.

6.8.3.2.2.1. The terminal controller may place additional restrictions, e.g., “do not drop south of the east-west running river” or “do not drop north of the one nine grid line”. Friendly location coordinates should never be passed.

6.8.3.2.3. Aircrews will read back (verbally or digitally) Line 4 (elevation), Line 6 (coordinates), and any “restrictions” IAW JP3-09.3. Terminal controllers may request read back of any items.

6.8.3.2.3.1. Terminal controllers will confirm with the aircrew what coordinates reference system and format is required (e.g., “WGS-84, latitude/longitude, in degree, minutes, and decimal minutes”).

6.8.3.2.4. The TAC will determine if the attacking aircraft will use the target coordinates and elevation passed in the CAS briefing or (if applicable) use an aircraft sensor to positively identify and target the weapon. In either case, the aircrew will transmit the target elevation and location, read from the weapon’s system display to the TAC for verification. If applicable, the aircrew will notify what aircraft sensor will be used to affect a release and the target description, e.g., “releasing on radar on the northern most tank in a line of five”.

6.8.3.2.4.1. If possible, terminal controllers will conduct a talk-on using visual cues that can be translated by the aircrew using an aircraft sensor to identify the target. If

visual-to-sensor talk-on is not possible, terminal controllers may elect to conduct a talk-on using a sufficiently detailed map, e.g., a 1:50,000 scale.

6.8.3.2.5. Terminal controllers may request the weapon's time-of-flight prior for integration/deconfliction.

6.8.3.2.6. Aircrew transmits an "IN" or "Departing IP" call with Time-to-Release indicating the aircraft is on the bomb run and requires clearance to release. The terminal controller will respond with one of three calls: "CLEARED HOT," "CONTINUE," or "ABORT." NOTE: The "CLEARED HOT" call may be given immediately after the aircrew and TAC have confirmed system acceptance of the target coordinates. Delaying the "CLEARED HOT" call may unnecessarily affect the aircrew's ability to release the weapon.

6.8.3.2.7. If the aircraft has not received "CLEARED HOT" by 60 seconds to release, the aircrew will make a "Callsign, 30 seconds to release, awaiting clearance" call.

6.8.3.2.8. At weapons release, aircrew will transmit "OFF HOT" or "OFF DRY" and time-of-fall.

**6.9. Operations With JSTARS.** The following additional procedures apply during Air-to-Surface training with JSTARS:

6.9.1. JSTARS has no inherent identification capability. All target identification requires off-board cross-cueing and can cause time delays.

6.9.2. JSTARS provides procedural control through airspace lateral and timing deconfliction as reflected in the ACO or delineated real-time tactical control using a complete 9-Line brief with the mandatory read back Line 4 (elevation), Line 6 (coordinates), and any "restrictions" IAW JP3-09.3.

6.9.3. JSTARS does not provide radar control to aircraft. TADIL-J is used only for situational awareness of asset positioning and will not be used to provide "VECTORS". JSTARS will not participate in Terminal Control procedures.

6.9.4. [Attachment 4](#) "JSTARS Coordination Guide" provides a general coordination sheet. Execution specifics will be delineated between the aircrew and ABM/WD.

6.9.5. Aircrews will not penetrate a 3000 ft bubble vertically or horizontally of the JSTARS.

RONALD E. KEYS, Lt General, USAF  
DCS/Air and Space Operations

**Attachment 1****GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

AFDD1, *Air Force Basic Doctrine*  
AFI 11-202, Volume 3, *General Flight Rules*  
AFI 11-231, *Computed Air Release Point Procedures*  
AFI 11-2MH53, Volume 3 (or joint equivalent), *Helicopter Operations*  
AFI 11-2H-1V3\_AFSPC SUP 1, *Helicopter Operations*  
AFI 11-2MDSV1, *Aircrew Training*  
AFI 11-2MDSV3, *Aircraft Operations Procedures*  
AFI 13-212, Volume 1, *Range Planning and Operations*  
AFI 13-212, Volume 3, *Safe-Range Program Methodology*  
AFI 13-217, *Drop Zone and Landing Zone Procedures*  
AFJI 36-2220, *Joint USAF/USA/USN/USMC Air Combat Training*  
AFJPAM 10-228, *Multi-Service Air-Air, Air-Surface, Surface-Air Brevity Codes*  
AFTTP 3-1, *Tactical Employment*  
AFTTP(I) 3-2.6, *J-FIRE Multi-service Procedures for the Application of Firepower*  
AFTTP 3-3, *Combat Aircraft Fundamentals*  
CJCSM 3212.02, *Performing Electronic Attack in the U.S. and Canada for Tests, Training, and Exercises*.  
JP3-04.1, *Joint Tactics Techniques and Procedures for Shipboard Helicopter Operations*  
JP3-09.1, *Joint Tactics, Techniques and Procedures for Laser Designation Operations*  
JP3-09.3, *Joint Tactics, Techniques and Procedures for Close Air Support (CAS)*  
T.O. 1-1M-34, *Aircrew Weapons Delivery Manual (Nonnuclear)*  
T.O. 1-1M-34-1, *Aircrew Weapons Delivery Manual (Nonnuclear)* (classified)  
T.O. 1-1C-1, *Basic Flight Crew Air Refueling Manual*

***Abbreviations and Acronyms***

A/A—Air-to-Air  
ABCCC—Airborne Battlefield Command and Control Center  
ABM/WD—Air Battle Manager/Weapons Director  
ACBT—Air Combat Training  
ACC—Air Combat Command

**ACM**—Airspace Control Measure

**ACO**—Airspace Control Order

**ACT**—Air Combat Tactics

**AETC**—Air Education and Training Command

**AFRC**—Air Force Reserve Command

**AFSOC**—Air Force Special Operations Command

**AGL**—Above Ground Level

**AGTS**—Aerial Gunnery Target System

**AI**—Air Interdiction or Air Intercept

**ALEP**—Aircrew Laser Eye Protection

**ALO**—Air Liaison Officer

**AMC**—Airborne Mission Commander or Air Mobility Command

**AMWC**—Air Mobility Warfare Center

**ANG**—Air National Guard

**AOB**—Air Order of Battle

**AOC**—Air Operations Center

**AOR**—Area of Responsibility

**ARCP**—Air Refueling Control Point

**ARCT**—Air Refueling Control Time

**ARM**—Anti-radiation Missile

**ATC**—Air Traffic Control

**ATO**—Air Tasking Order (FRAG)

**AWACS**—Airborne Warning and Control System

**BFM**—Basic Fighter Maneuvers

**BHM**—Basic Helicopter Maneuvers

**BMC**—Basic Mission Capable

**BP**—Battle Position

**BRAA**—Bearing, Range, Altitude and Aspect of target

**BVR**—Beyond Visual Range

**CADS**—Combat Aerial Delivery School

**CAF**—Combat Air Forces

**CAS**—Close Air Support

**CCA**—Command and Control Agency

**CFT**—Composite Force Training

**CMR**—Combat Mission Ready

**COMSEC**—Communications Security

**CP**—Control Point

**CSAR**—Combat Search and Rescue

**CT**—Continuation Training

**DART**—Deployable Aerial Reflective Target

**DCA**—Defensive Counterair

**DF**—Direction Finding

**DLO**—Desired Learning Objective

**EA**—Electronic Attack

**EEI**—Essential Elements of Information

**EMCON**—Emission Control (EMCON 1 – Normal Comm, EMCON 2 – Restricted Comm, EMCON 3 – Comm Out, EMCON 4 – Emission Out)

**EP**—Electronic Protection

**EOB**—Electronic Order of Battle

**FAA**—Federal Aviation Administration

**FAC(A)**—Forward Air Controller-Airborne

**FAM**—Familiarization

**FEBA**—Forward Edge of the Battle Area

**FLIP**—Flight Information Publication

**FLIR**—Forward Looking Infrared

**FLOT**—Forward Line of Own Troops

**FTS**—Fighter Training Squadron

**FTU**—Formal Training Unit

**G**—Gravity

**GCI**—Ground Controlled Intercept

**GLO**—Ground Liaison Officer

**GPS**—Global Positioning System

**HI**—High Illumination

**HUD**—Head-Up Display

**ICAO**—International Civil Aviation Organization

**IFF**—Identification, Friend or Foe/Initial Fighter Fundamentals

**IFR**—Instrument Flight Rules

**IG**—Inspector General

**IMC**—Instrument Meteorological Conditions

**IP**—Initial Point or Instructor Pilot

**IR**—Infrared

**ISR**—Intelligence, Surveillance, and Reconnaissance

**JAAT**—Joint Air Attack Team

**JOA**—Joint Operations Area

**JSTARS**—E-8, Joint Surveillance Target Attack Radar System

**KIAS**—Knots Indicated Airspeed

**KIO**—Knock-It-Off

**km**—kilometer

**LAHD**—Low Angle High Drag

**LANTIRN**—Low-Altitude Navigation and Targeting Infrared for Night

**LAS**—Low Angle Strafe

**LATN**—Low Altitude Tactical Navigation

**LI**—Low Illumination

**LOS**—Line-of-Sight

**LRS**—Long Range Strafe

**LTD**—Laser Target Designator

**MAAP**—Master Air Attack Plan

**MAF**—Mobility Air Force

**MAJCOM**—Major Command

**MC**—Mission Capable

**MDS**—Model Designation Series

**MOA**—Military Operating Area

**MQT**—Mission Qualification Training

**MR**—Mission Ready

**MSA**—Minimum Safe Altitude

**MSL**—Mean Sea Level

**MTI**—Moving Target Indicator

**MTR**—Military Training Route  
**NAF**—Numbered Air Force  
**nm**—Nautical Mile  
**NORAD**—North American Aerospace Defense Command  
**NVG**—Night Vision Goggles  
**OCA/ESC**—Offensive Counterair/Escort  
**OPLAN**—Operation Plan  
**OPORD**—Operation Order  
**OPSEC**—Operations Security  
**OSC**—On Scene Commander  
**OT&E**—Operational Test and Evaluation  
**PACAF**—Pacific Air Forces  
**POM**—Plane of Motion  
**PTC**—Positive Target Control  
**RAOC**—Regional Air Operations Center  
**RCO**—Range Control Officer  
**ROE**—Rules of Engagement  
**RTO**—Range Training Officer  
**RWR**—Radar Warning Receiver  
**SA**—Surface Attack or Situational Awareness  
**SAG**—Surface Action Group  
**SALT**—Size, Activity, Location, Time  
**SAM**—Surface-to-Air Missile  
**SAOC**—Sector Air Operations Center  
**SAR**—Search and Rescue/Synthetic Aperture Radar  
**SAT**—Surface Attack Tactics  
**SCP**—Set Clearance Plane  
**SEAD**—Suppression of Enemy Air Defenses  
**SIF**—Selective Identification Feature  
**SMS**—Stores Management System  
**SOF**—Supervisor of Flying  
**SPINS**—Special Instructions

**STV**—Steerable Television  
**TA**—Training Area or Terrain Avoidance  
**TAC**—Terminal Attack Controller  
**TACP**—Tactical Air Control Party  
**TACS**—Theater Air Control System  
**TADIL-J**—Tactical Digital Information Link - Joint  
**TI**—Tactical Intercepts  
**TF**—Terrain Following  
**TFR**—Terrain Following Radar  
**T.O.**—Technical Order  
**TOD**—Time of Day  
**TOT**—Time on Target  
**TR**—Training Rule  
**TTS**—Two Target Strafe  
**TTT**—Time to Target  
**ROA**—Remotely Operated Aircraft  
**USAFE**—United States Air Force Europe  
**USAFWS**—USAF Weapons School  
**UTM**—Universal Transverse Mercator  
**VECP SD**—Value Engineering Change Proposal Smokey Devil  
**VR-VFR**—Visual Flying Route  
**VID**—Visual Identification  
**VMC**—Visual Meteorological Conditions  
**WG/CC**—Wing Commander  
**WIC**—Weapons Instructor Course  
**WP**—White Phosphorous  
**WSEP**—Weapons System Evaluation Program

### ***Terms***

**Adversary**—An aircrew or aircraft flying as an opponent during Air-to-Air training.  
**Air Combat Tactics**—Training in the application of BFM and ACM skills to achieve a tactical Air-to-Air objective.  
**Air Combat Training**—A general term that includes (D)BFM, (D)ACM, and (D)ACT.

**Air Refueling Track**—A flight path designated for air refueling.

**Aspect Angle**—The angle between the longitudinal axis of the target (projected rearward) and the line of sight to the interceptor measured from the tail of the target.

**Attacker**—Air-to-Air: An aircraft simulating carrying Air-to-Air ordnance engaged in offensive maneuvering. Air-to-Surface: An aircraft in the process of delivering Air-to-Surface ordnance.

**Attack Restriction**—Ingress, ordnance delivery, or egress restrictions depending on situation, (such as, threats, weather, terrain, rules of engagement, etc.)

**Autonomous**—Aircrew is operating without benefit of information or guidance from a controlling Agency.

**Bandit**—A positive identification of enemy aircraft. The term is a function of identification and does not necessarily imply direction or authority to engage.

**Basic Fighter Maneuvers**—Training designed to apply aircraft handling skills to gain proficiency in recognizing and solving range, closure, aspect, angle off, and turning room problems in relation to another aircraft to either attain a position to employ weapons, deny the adversary a position to employ weapons, or defeat weapons employed by an adversary.

**Bingo Fuel**—A prebriefed fuel state that allows the aircraft to return to the base of intended landing or alternate, if required, using preplanned recovery parameters and arriving with normal recovery fuel.

**Bogey**—A radar or visual contact whose identity is unknown.

**Bogey Dope**—A request for target information as requested or closest group in BRAA (with appropriate fill-ins).

**Bomber**—Any "B" designated aircraft (B-1, B-2, or B-52).

**Brevity Words**—Succinct phrases or individual words used to convey a more complex message in a tactical environment. AFTTP 3-1.1 and AFTTP(I)3-2.5, contain additional brevity code words.

**Cell**—Two or more tankers flying in formation.

**Class A Range**—A manned range as defined in AFI 13-212, Volume 1 Range Planning and Operations, where a range control officer is present with two-way radio voice communication capability.

**Class B Range**—A manned or unmanned range with scoring capability, but no range control officer.

**Class C Range**—An unmanned range with no scoring or control capability.

**Closure**—Relative velocity of one aircraft in relation to another.

**Comm Jam/Jamming**—Attempt to interrupt communication.

**Commit**—Directive call to intercept a group of interest.

**Composite Force**—Multiple flights of the same or different MDS aircraft, each under the direction of its own flight leader performing the same or different roles.

**Defender**—Any type of aircraft attempting to defeat or deny an adversary's weapons employment.

**Defensive Maneuvering**—Maneuvers designed to negate the attack or ordnance of a maneuvering adversary, surface or airborne.

**Electronic Attack**—That division of electronic warfare involving the use of electromagnetic or directed

energy to attack personnel, facilities, or equipment with the intent of degrading, neutralizing, or destroying enemy combat capability. Also includes: 1) actions taken to prevent or reduce an enemy's effective use of the electromagnetic spectrum, such as jamming and electromagnetic deception, and 2) employment of weapons that use either electromagnetic or directed energy as their primary destructive mechanism (lasers, radio frequency weapons, particle beams).

**Electronic Warfare**—Any military action involving the use of electromagnetic and directed energy to control the electromagnetic spectrum or to attack the enemy.

**Element**—A flight of two aircraft.

**Element Pop-up**—A two ship pop-up attack where the wingman's only reference is the flight lead.

**Emergency Rendezvous**—Used in the event an aircraft experiences an in-flight emergency. Normally a Point Parallel rendezvous is used to accommodate the emergency aircraft, although a receiver turn-on or a modified short set up rendezvous (“150-30” and the “90-90”) may also be used.

**Engaged/Engagement**—Informative call used to establish engaged and support roles in visual arena. Maneuvers by one or more opposing aircraft attempting to achieve or prevent weapons firing positions.

**Flag Exercises**—Red Flag, Maple Flag, etc.

**Frag**—Air tasking order.

**Friendly**—A positively identified friendly aircraft or ground position.

**Ground EA Environment Exercise**—An exercise in which fighter activity combines with countering ground based EW/GCI, acquisition, or communications.

**Hard Target**—Any target, moving or fixed, with armored/physical protection requiring increased precision/weapons yield.

**High Angle Snap Shot Gun Exercise**—A gun shot made with a high track-crossing angle, normally attempted because a tracking shot was not possible or desired.

**High Illumination**—A minimum of 2.2 millilux illumination derived from natural or artificial sources (unless defined otherwise in aircraft specific AFI 11-2MDS series instructions).

**Hostile**—A contact positively identified as enemy upon which clearance to fire is authorized in accordance with theater rules of engagement.

**Hung Ordnance**—Any item attached to the aircraft for the purpose of dropping or firing which has malfunctioned or failed to release. In addition, hung ordnance includes the following items: (1) Live unexpended ordnance, excluding 20/30 mm ammunition and Air-to-Air missiles; (2) External fuel tanks after unsuccessful jettison attempt; (3) Remaining ordnance after an inadvertent release; (4) 20/30 mm ammunition after a gun malfunction (no fire, unplanned cease fire, runaway gun, or gun unsafe indication); (5) Any stores determined to be in an unsafe condition.

**Initial Trainer Aircraft**—AETC aircraft used for initial flight training (T-37, T-1A, T-38, and T-43).

**Intercept**—The phase of an Air-to-Air mission between the commit and the engagement when the fighter executes a series of maneuvers using ground controlled intercept, Airborne Warning and Control System, on board systems, or dead reckoning, to place the aircraft or flight in a position to employ Air-to-Air ordnance, make a visual identification, or initiate a visual engagement.

**Inadvertent Release**—Uncommanded fired or dropped ordnance. If commanding a single release, do not

consider a double bomb release as an inadvertent release if the releases occur from a practice bomb dispenser.

**Inert Ordnance**—Ordnance with no explosive or incendiary material (Includes BDU-50).

**Jettison**—The selective release of stores from an aircraft for other than a normal attack.

**Joker Fuel**—A prebriefed fuel state that requires a transition in the phase of flight (i.e., depart the working area for Air-to-Air refueling) or prepare for RTB.

**Judy**—The aircrew has radar or visual contact on the correct target, has taken control of the intercept, and only requires situational awareness information; ABMs/WDs will minimize radio transmission. Can be specified for only a portion of the information (Judy angles) or a portion of the scenario.

**Knock-It-Off (KIO)**—Procedures used to cease tactical maneuvering when safety of flight is a factor, where doubt or confusion exists, or desired learning objectives are met for an entire scenario.

**Large Force Exercise**—Training where more than 10 aircraft are operating in the assigned airspace

**Live Ordnance**—Combat type ordnance incorporating explosive or incendiary material including night illumination flares. Do not consider self-protection flares and spotting charges as live ordnance.

**Low Altitude**—Below 5,000 feet AGL or as defined by MAJCOM.

**Low Altitude Air Refueling (LAAR)**—Air-refueling conducted below 12,000 feet MSL or 10,000 feet AGL, whichever is higher (Exception: Below 5,000 feet AGL constitutes C-130 low altitude refueling). AR operations based at or above 12,000 feet MSL that momentarily fall below 10,000 feet AGL, but not less than 5,000 feet AGL, due to overflight of mountain ridges, peaks, etc., are not considered LAAR.

**Low Altitude Tactical Navigation**—Low altitude training using the fundamental aspects of dead reckoning and point-to-point low altitude navigation, with or without prior route planning.

**Low-Altitude Training**—Mission oriented operations in the low block altitude.

**Lowdown**—A request to provide tactical ground information pertinent to the mission in a digital bullseye format

**Low Illumination**—Less than 2.2. millilux (unless defined otherwise in aircraft specific AFI 11-2MDS series instructions).

**Minimum Safe Altitude**—The defined altitude that provides 1,000 feet of clearance above the highest obstacle/terrain feature (rounded to the next highest 100 feet) within 5 nm of the planned course, routed boundaries, or operations area.

**Minimum Risk/Safe Passage**—Usually defined in a theater Air Control Order to aid in the safe return of a friendly aircraft that is unable to communicate and/or cannot verify the working status of its IFF/SIF transponder.

**Mixed Force**—The employment of a single flight of different MDS aircraft, performing the same tactical role, under the direction of a single flight leader.

**Mutual Support**—That support which units render each other against an enemy, because of their assigned tasks, their position relative to each other and to the enemy, and their inherent capabilities.

**Night**—The time between the end of evening civil twilight and the beginning of morning civil twilight as published in the American Air Almanac, converted to local time.

**Offensive Maneuvering**—Maneuvers against an opponent to achieve weapons parameters.

**Overwater Range**—Range complex that immediately surrounds the target or designed mean point of impact over water.

**Picture**—A request to provide tactical air information pertinent to the mission in a digital bullseye format.

**Playtime**—Amount of time aircraft can remain on station.

**Point Parallel Rendezvous**—Used to affect a timely join-up between a tanker and a receiver with minimum receiver maneuvering. The tanker makes the final turn for the desired refueling heading.

**Practice Ordnance**—Ordnance specifically designed or modified for practice. BDU-33, BDU-38, BDU-48, MK-106, TGLM, ATM, CATM, PTM, and classify ball (or tracer - TPT) gun ammunition as practice ordnance.

**Receiver Turn-On/Tactical Rendezvous**—Used to join up a tanker and receiver with minimum tanker maneuvering. Primarily used when there are multiple receivers scheduled simultaneously on the tanker. Rendezvous geometry is basically the same as a stern intercept.

**Release**—In air armament, the intentional separation of a free-fall aircraft store, from its suspension equipment, for purposes of employment of the store.

**Rules of Engagement (ROE)**—Specific constraints applicable to operational real-world peacetime, wartime, or contingency mission employment. OPlans, Contingency Plans, or other operational documents will contain ROE. Specific ROE may include, but are not limited to, political considerations, tactical restrictions, engagement or weapons employment criteria, and any other procedures constraining employment.

**Situational Awareness (SA)**—The level the warfighter/aircrew is able to recognize, process, and react to both external and internal factors in a dynamic environment to increase lethality, survivability, and mission effectiveness.

**Skip It**—Veto of fighter commit call, usually followed with further directions. In air intercepts, a term meaning, "Do not attack," "Cease attack," "Cease interception."

**Sour**—Invalid /no response to an administrative IFF/SIF check. Opposite of Sweet.

**Special Instructions (SPINS)**—Restrictions, procedures, and scenario elements applicable to specific scenarios, missions, or exercise.

**Sweet**—Valid response to an administrative IFF/SIF check request. Opposite of Sour

**Tactical Formation**—Formations, as defined by AFTTP 3-1 and AFTTP 3-3, that provides mutual support.

**Tanker**—Any "KC" designated aircraft (e.g., KC-10, KC-135).

**Target**—A directive call to assign group responsibility. Area on a range complex where the desired mean point of impact is located.

**Terminate**—Procedures used when safety of flight is not a factor and to indicate stopping ownship maneuvering.

**Training Ordnance**—Ordnance used in conduct of training. This includes practice ordnance, in

ordnance and live ordnance.

**Training Rules (TR)**—Peacetime rules, procedures, and standards governing Air-to-Air and Air-to-Surface training that, when violated, jeopardize flight safety.

**Unexpended Ordnance**—Ordnance that is still onboard because no release was attempted.

**Unintentional Release**—Ordnance fired or dropped through pilot error.

**Attachment 2****AIR-TO-AIR TRAINING COORDINATION AND BRIEFING GUIDE**

(To be used for face-to-face, telephonic briefings, or for message formats)

**A2.1. Date/Time:****A2.2. Participants:**

- A2.2.1. Units
- A2.2.2. Aircraft Types
- A2.2.3. Call Signs

**A2.3. Mission Commander or Deputy Mission Commander:****A2.4. Working Area or Airspace Limits:**

- A2.4.1. Times
- A2.4.2. Horizontal Boundaries
- A2.4.3. Vertical Limits
- A2.4.4. Minimum Altitudes
- A2.4.5. EA (Electronic Attack), EP (Electronic Protection), and Flare Restrictions and Clearances
- A2.4.6. Controlling Agencies
- A2.4.7. Emergency Bases
- A2.4.8. Weather

**A2.5. Scenario SPINS:**

- A2.5.1. Scenario, Mission, and Learning Objectives
- A2.5.2. Situation, State, and Stage of Alert
- A2.5.3. Type aircraft simulated
- A2.5.4. Ordnance simulated (number and type)
- A2.5.5. Roles and Tactical Objectives
- A2.5.6. Performance and Avionics constraints
- A2.5.7. Tactics constraints
- A2.5.8. Maneuvering Limits (Maneuvering Categories, Aircraft Maneuvering Limits)
- A2.5.9. Points, Defended Areas, and Homes
- A2.5.10. ROE (Hostile acts, BVR requirements, employment constraints)
- A2.5.11. Valid shot parameters

- A2.5.12. Kill criteria
- A2.5.13. Shot and Kill passing
- A2.5.14. Kill removal
- A2.5.15. Level of GCI or AWACS control
- A2.5.16. Frequencies and Have Quick Nets
- A2.5.17. Squawks
- A2.5.18. Blocks
- A2.5.19. Surface threats
- A2.5.20. Simulated geographic points (FEBA, threats)

**A2.6. Rendezvous Procedures (location, altitude, time, method):**

**A2.7. Training Rules (if nonstandard):**

**A2.8. Knock-it-Off Criteria:**

**A2.9. Alternate Missions:**

- A2.9.1. Fewer than planned aircraft
- A2.9.2. Single frequency
- A2.9.3. Single GCI or AWACS scope
- A2.9.4. No GCI or AWACS
- A2.9.5. Weather

**A2.10. Recovery and Escort Procedures:**

**A2.11. Emergency Procedures:**

**A2.12. Debriefing (Time and Place):**

**Attachment 3****AIRCREW/AWACS-GCI COORDINATION GUIDE**

(Use for Face-to-Face, Telephonic, or In-Flight Coordination)

***Section A3A—Briefing*****A3.1. Participants:**

- A3.1.1. Units
- A3.1.2. Aircraft Types
- A3.1.3. Call Signs

**A3.2. Working Area:**

- A3.2.1. Times
- A3.2.2. Horizontal Boundaries, Vertical limits, MSA
- A3.2.3. Entry, Exit Points, and Routing
- A3.2.4. Rendezvous Procedures (location, altitude, time, method)

**A3.3. Scenario SPINS:**

- A3.3.1. Scenario, Mission, and Training Objectives
- A3.3.2. Situation, State, and Stage of Alert
- A3.3.3. Type aircraft simulated
- A3.3.4. Type ordnance simulated
- A3.3.5. Roles and Tactical objectives
- A3.3.6. Points, Defended areas
- A3.3.7. ROE ( Hostile acts, ID and BVR requirements, employment constraints)
- A3.3.8. Shot and Kill passing method
- A3.3.9. Type of Control and Communication Format (e.g., Tactical Control, Digital Bullseye format)
- A3.3.10. Frequencies and Have Quick Nets
- A3.3.11. Squawks
- A3.3.12. Blocks
- A3.3.13. Surface Threats
- A3.3.14. Simulated Geographic Points (FEBA, threats)
- A3.3.15. Vulnerability Times
- A3.3.16. Knock-it-off Criteria

**A3.4. CAP Points**

**A3.5. Commit Criteria**

**A3.6. Tactics:**

A3.6.1. Expected adversary tactics

A3.6.2. Friendly tactics

**A3.7. Training Rules:**

**A3.8. Alternate Missions:**

A3.8.1. Fewer than planned aircraft

A3.8.2. Single frequency

A3.8.3. Single scope control

A3.8.4. No control

A3.8.5. Weather

**A3.9. Special Training Requirements:**

**A3.10. Rendezvous and Recovery:**

**A3.11. Emergencies:**

A3.11.1. Assistance required

A3.11.2. Lost Comm procedures

***Section A3B—Debriefing***

**A3.12. Accomplishment of Mission Objectives:**

**A3.13. Tactics Used:**

**A3.14. Lessons Learned:**

**Attachment 4****AIRCREW/JOINT STARS COORDINATION GUIDE****A4.1. Participants:**

A4.1.1. Units

A4.1.1.1. Phone Numbers

A4.1.1.2. Contact Frequencies

A4.1.2. Aircraft Types

A4.1.3. Callsigns

**A4.2. Working Area:**

A4.2.1. Takeoff Times, Time in Airspace

A4.2.2. Location and Boundaries

A4.2.3. Entry, Exit Points, and Routing

A4.2.4. Vertical Limits

A4.2.5. EA/EP Considerations

A4.2.6. **Weather**

**A4.3. Scenario:**

A4.3.1. Mission Type

A4.3.2. Mission/Training Objectives

A4.3.3. Rules of Engagement

A4.3.4. Ordnance

A4.3.5. Bullseye

A4.3.6. Holding Points

A4.3.7. Surface Threats

A4.3.8. Codewords

A4.3.9. BDA

A4.3.10. Number of Passes

**A4.4. Communications:**

A4.4.1. Review AFTTP 3-1.30, Attachment 2

A4.4.1.1. Lowdown

A4.4.1.2. Details

A4.4.1.2.1. Lat /Long

A4.4.1.2.2. UTM

A4.4.1.2.3. Moving Targets

A4.4.1.2.4. Fixed Targets

A4.4.1.3. Target Talk-On

A4.4.1.4. Route Screening

A4.4.1.5. SALT (Size, Activity, Location, Time)

A4.4.2. Deviations

A4.4.3. Frequencies

A4.4.3.1. Primary/Secondary

A4.4.3.2. Have Quick

A4.4.3.3. Secure

A4.4.3.4. Chattermark Plan

A4.4.3.5. Net

A4.4.3.6. Mickey source

A4.4.3.7. Tape

A4.4.4. Authenticators

**A4.5. Alternate Missions:**

A4.5.1. Degraded Radar

A4.5.2. Loss of Airspace

A4.5.3. Weather

**A4.6. Emergencies:**

A4.6.1. Assistance Required

A4.6.2. Lost Comm Procedures

**A4.7. Debrief:**

A4.7.1. Time

A4.7.2. Place

A4.7.3. Telephone Numbers

A4.7.4. Names

A4.7.5. Review Objectives

## Attachment 5

### BOMBER EXERCISE COORDINATION GUIDE

**A5.1. General.** This coordination guide applies during Ground EA Environment Exercise and fighter Air-to-Air training with bomber aircraft.

**A5.2. Aircrew Responsibilities.** The bomber aircrew will contact the RAOC/SAOC and provide the following:

- A5.2.1. Aircraft call sign.
- A5.2.2. Ground EA Environment Exercise scheduled.
- A5.2.3. Initial Point (IP),
- A5.2.4. IP time.
- A5.2.5. Scheduled training area (TA).
- A5.2.6. Present position and altitude.
- A5.2.7. IFF and SIF mode.
- A5.2.8. Crew number,
- A5.2.9. Armament safety check completed.
- A5.2.10. Request for chaff, flare, explosive chaff, or electronic jamming clearance.
- A5.2.11. Desired EA start time after IP and frequency.
- A5.2.12. Confirmation of bomber defensive maneuvers and the briefing of all participants.
- A5.2.13. Request ABM/WD number.

**A5.3. RAOC/SAOC Responsibilities.** The RAOC/SAOC will record this information provided by the aircrew and provide the bomber crew with the following:

- A5.3.1. Positive Target Control (PTC) - IFF and SIF setting.
- A5.3.2. Confirm radio and SIF contact.
- A5.3.3. If authorized defensive maneuvering.
- A5.3.4. ABM/WD number.
- A5.3.5. EA, chaff, flares, or explosive chaff clearance and operating bands.
- A5.3.6. Altitudes available for training.

## Attachment 6

### LOW/SLOW VID PROCEDURES

**A6.1. General.** This attachment prescribes end-game procedures used for aircraft executing a visual identification (VID) maneuver on low or slow aircraft (non-fighter). Apply the separation and airspeed minimums in this attachment after the intercept is complete and closure is under control. Use the following procedures in the absence of other MAJCOM directives or requirements.

**A6.2. Altitude Separation.** Aircrews will maintain a minimum of 1,000 feet vertical separation throughout the VID when directed to conduct a beam or front conversion. Aircrews will use altitude readouts from on-board radar as the primary method for ensuring altitude separation. Use other means of determining target altitude such as verbal confirmation of altitude by the target aircraft or Mode 3/C IFF altitude readouts as backups to confirm target altitude and ensure minimum separation. If unable to positively determine vertical separation by 10 nm, convert the intercept to stern geometry.

**A6.3. Intercept Procedures.** Fighters performing a stern aspect intercept and rendezvous to VID will adhere to the following:

A6.3.1. Maintain a minimum of 1,000 feet vertical separation between the fighter and target aircraft until positive radar or visual contact in the stern aspect of the target.

A6.3.2. Proceed no closer than 3 nm, or at co-altitude if inside 3 nm without visual contact unless positive radar contact provides target range, azimuth, and elevation.

A6.3.3. Proceed no closer than 1 nm without positive radar lock-on providing target range, azimuth, elevation, and closure rate. (Exception: the fighter may proceed inside 1 nm during daylight conditions with a visual contact on the target.)

A6.3.4. At night, IMC, or during the day without visual contact, do not proceed inside 1 nm range unless attaining an approximate co-speed (a maximum of 50 knots closure) condition.

A6.3.5. Fighters will use the following to determine minimum airspeeds:

A6.3.5.1. F-15: 20 Units AOA

A6.3.5.2. F-16 CAT I: 13 Units AOA

A6.3.5.3. F-16 CAT III: 200 KIAS

A6.3.6. Proceed no closer than the following minimum slant range without a visual contact:

A6.3.6.1. F-15/F-16: 1500 Feet

A6.3.6.2. F-16ADF (VID Mode): 700 Feet or break "X," whichever occurs first.

A6.3.7. Minimum range is 500 foot. The fighter may move inside 500 feet slant range to the target if flight safety is not jeopardized and it is necessary to accomplish the mission (e.g., aiding an aircraft in distress or intelligence collection). In this case, the mission will dictate the maximum closure and minimum slant ranges required.

A6.3.8. Execute an immediate breakaway from the target if any of the following occurs:

A6.3.8.1. Radar contact is lost with no visual contact and inside 3 nm.

A6.3.8.2. Radar lock-on is lost (unless in daylight conditions and visual contact is maintained) and inside 1 nm.

A6.3.8.3. Visual contact is lost and inside minimum range.

**Attachment 7****AIR-TO-AIR LIVE FIRE PROCEDURES**

**A7.1. Aerial Gunnery.** The following rules apply to missions involving live gun firings against towed targets.

A7.1.1. General:

A7.1.1.1. The TRs in this instruction apply with the following additional restrictions:

A7.1.1.1.1. Implement procedures to ensure the range is clear of surface activity and other aircraft before firing over an undercast.

A7.1.1.1.2. Cease fire if sighting any surface activity or other aircraft in the bullet impact area.

A7.1.1.1.3. A Range Control Officer (RCO) must be present during firing.

A7.1.1.2. Responsibilities:

A7.1.1.2.1. Flight Leader. After join-up with the tow aircraft, the engaging flight leader will become the RCO with the following responsibilities:

A7.1.1.2.1.1. Conduct all firing within the boundaries of the applicable area or range.

A7.1.1.2.1.2. Ensure the range is clear of surface and other airborne traffic at all times during firing.

A7.1.1.2.1.3. Ensure compliance with all TRs.

A7.1.1.2.1.4. Assess fouls.

A7.1.1.2.2. Tow Pilot:

A7.1.1.2.2.1. The tow pilot shares responsibility for safety during the mission to include:

A7.1.1.2.2.1.1. Ensures firing occurs within the range boundaries.

A7.1.1.2.2.1.2. Ensures the range is clear of traffic.

A7.1.1.2.2.1.3. Ensures TR compliance.

A7.1.1.2.2.2. Procedurally the tow pilot will:

A7.1.1.2.2.2.1. Receive the flight briefing.

A7.1.1.2.2.2.2. Fly the prebriefed pattern.

A7.1.1.2.2.2.3. Initiate radio calls to control the firing sequence.

A7.1.1.2.2.2.4. Assess fouls.

A7.1.1.2.2.2.5. Record hits for each pass

A7.1.1.3. Tow Procedures:

A7.1.1.3.1. The tow pilot will delay deploying the aerial towed target launch with a warning call if being chased.

A7.1.1.3.2. The tow pilot will establish a turn before issuing a "CLEARED TO FIRE" call.

#### A7.1.1.4. Shooter Procedures:

A7.1.1.4.1. Shooters will monitor the aerial target deployment and notify the tow if any malfunctions occur.

A7.1.1.4.2. Shooters will remain clear of a point directly below or astern the tow aircraft at all times.

A7.1.1.4.3. Shooters will acknowledge all calls from the tow pilot.

A7.1.1.4.4. Maintain safe separation from the target if the shooter air scores the target.

A7.1.1.4.5. Do not make firing passes on a target that rolls in a turn, is flying high on the tow, or flying in an erratic manner.

A7.1.1.4.6. While engaged, the shooter will maintain positive overtake and a minimum of 5 degrees angle-off to the inside of the target's turn.

A7.1.1.4.7. The shooter and chase must prepare to avoid target debris that will result from a hit. Immediately after firing, shooters will perform an escape maneuver to get out of the target's plane of motion (POM) and avoid a 5-degree cone aft of the target's POM.

A7.1.1.4.8. If the shooter requires a chase aircraft, the chase will maneuver as necessary to observe the firing distance, effectiveness, and shooter position relative to the gun line of fire. The chase will fly a position to avoid target debris and the shooter during the escape maneuver.

#### A7.1.1.5. Fouls. Assess a foul to the aircrew for any of the following conditions:

A7.1.1.5.1. Firing without a clearance.

A7.1.1.5.2. Firing from outside the turn of the target.

A7.1.1.5.3. Firing within 1,000 feet of the target.

A7.1.1.5.4. Flying within 800 feet of the target.

A7.1.2. Basic Patterns. The following section defines various setups available for AGTS training. The pattern selected and the tactics employed should meet the training requirements for the individual unit. Ideally, all AGTS missions will be employed as a two-ship element if two aircraft are available.

#### A7.1.2.1. Combat AGTS Pattern ([Figure A7.1.](#)):

A7.1.2.1.1. The tow will maintain 300 to 450 KIAS. The shooters will perform a two-ship front quarter tactical intercept using AFTTP 3-1 tactics. Shooters will ARM hot during the intercept. The altitude separation requirements in paragraph [5.2.9.](#) apply.

A7.1.2.1.2. Clearance for the tow ship to maneuver occurs when; (1) the tow ship has visual contact with one shooter and the shooters pass line abreast, (2) the attacking flight leader directs the tow ship to maneuver, or (3) as briefed by the attacking flight leader. The tow ship will issue the call "Cleared to Fire" after establishing the turn. Shooter tactics should include simulated missile employment culminating in a gun attack on the target. Continue attacks, using proper radio terminology and attack procedures, until finishing the engagement, time expires, reaching bingo fuel, Winchester, or approaching minimums. At this time, call a KIO and all members of the flight will acknowledge the call after this the tow may roll out of the turn.

A7.1.2.1.3. Each shooter will ensure that the other attacker is clear of the target before shooting. Normally, the old attacker should reposition high after firing to avoid conflict with the target and the new shooter's attack.

A7.1.2.2. Butterfly Pattern ([Figure A7.2.](#)):

A7.1.2.2.1. Begin the setup with the shooter and the tow flying in a co-altitude, line abreast, tactical formation. After the shooter(s) and the tow are ready, the flight lead calls, "check away," and the aircraft turn 45 degrees away from each other.

A7.1.2.2.2. During the turn away, the flight lead will call "Arm Hot" and the shooter(s) will arm hot. AT the briefed range, the flight lead will call, "Turn in, Fights On." The tow will turn into the shooters and reference 90 degrees off of the original heading. The shooter(s) will maneuver to the merge ensuring that they pass 3000 feet horizontally and 3000 feet above the tow.

A7.1.2.2.3. After the shooter(s) pass the tow's 3/9 position and the tow begins turning, the tow will call, "Cleared to Fire."

A7.1.2.2.4. The tow will maintain a constant g turn into the shooter(s). If there are two shooters, the first shooter will maneuver to a position to take a snap shot on the AGTS, and then reposition high and outside of the AGTS flight path. The second shooter will maneuver to a lower aspect angle gun attack after the first shooter has repositioned clear of the fight. After the second shooter has attempted a gun attack, call "KIO." If only one shooter is present, a "KIO" will be called after only one gun attack has been attempted.

A7.1.2.3. Perch Setup (see [Figure A7.3.](#)):

A7.1.2.3.1. Begin the setup with the shooter 6000 feet behind the tow with a radar lock on the AGTS (4000 feet radar range) and 10 to 30 degrees of aspect. The wingman will be in spread formation with the flight lead.

A7.1.2.3.2. When all aircraft are ready, the shooters will "Arm Hot," and the tow should make a "30 seconds" call indicating that the tow is accelerating to final towing airspeed. A "10 seconds" call will be made indicating that the tow is starting the turn. A "Cleared to fire" call will be made when the tow is turning and has a tally on all of the fighters.

A7.1.2.3.3. Once the setup begins, the fighters will cycle to the AGTS as outlined in the combat AGTS section [A7.1.2.1.2.](#)

Figure A7.1. Typical Racetrack Dart Pattern.

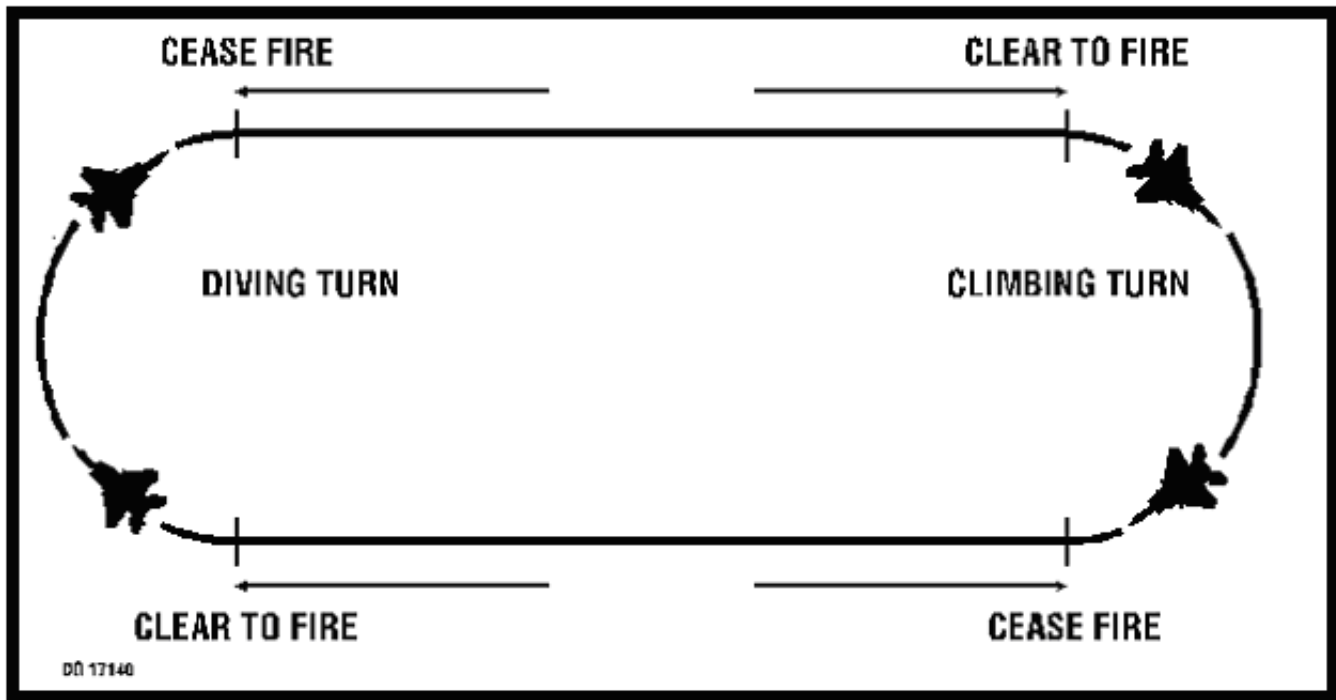


Figure A7.2. Typical Figure "S" Dart Pattern.

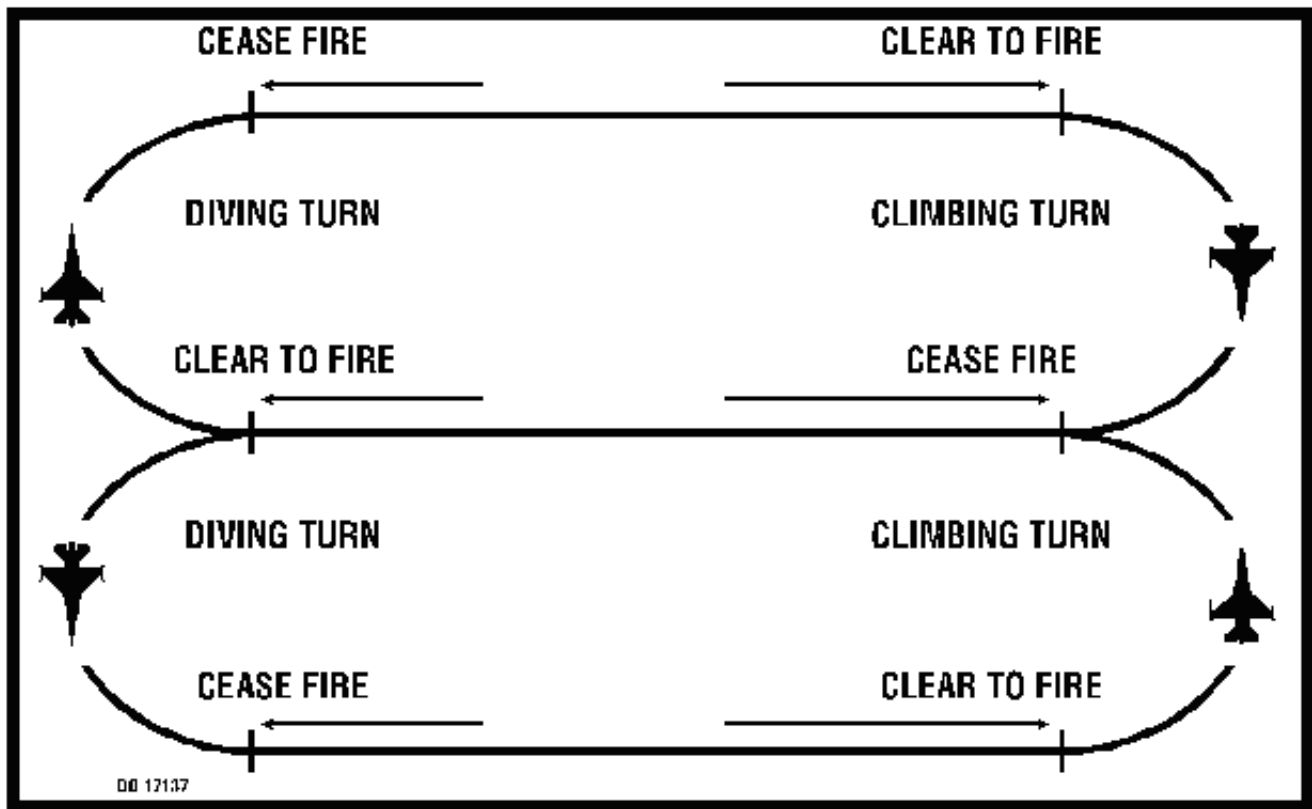


Figure A7.3. Typical Figure "8" Dart Pattern.

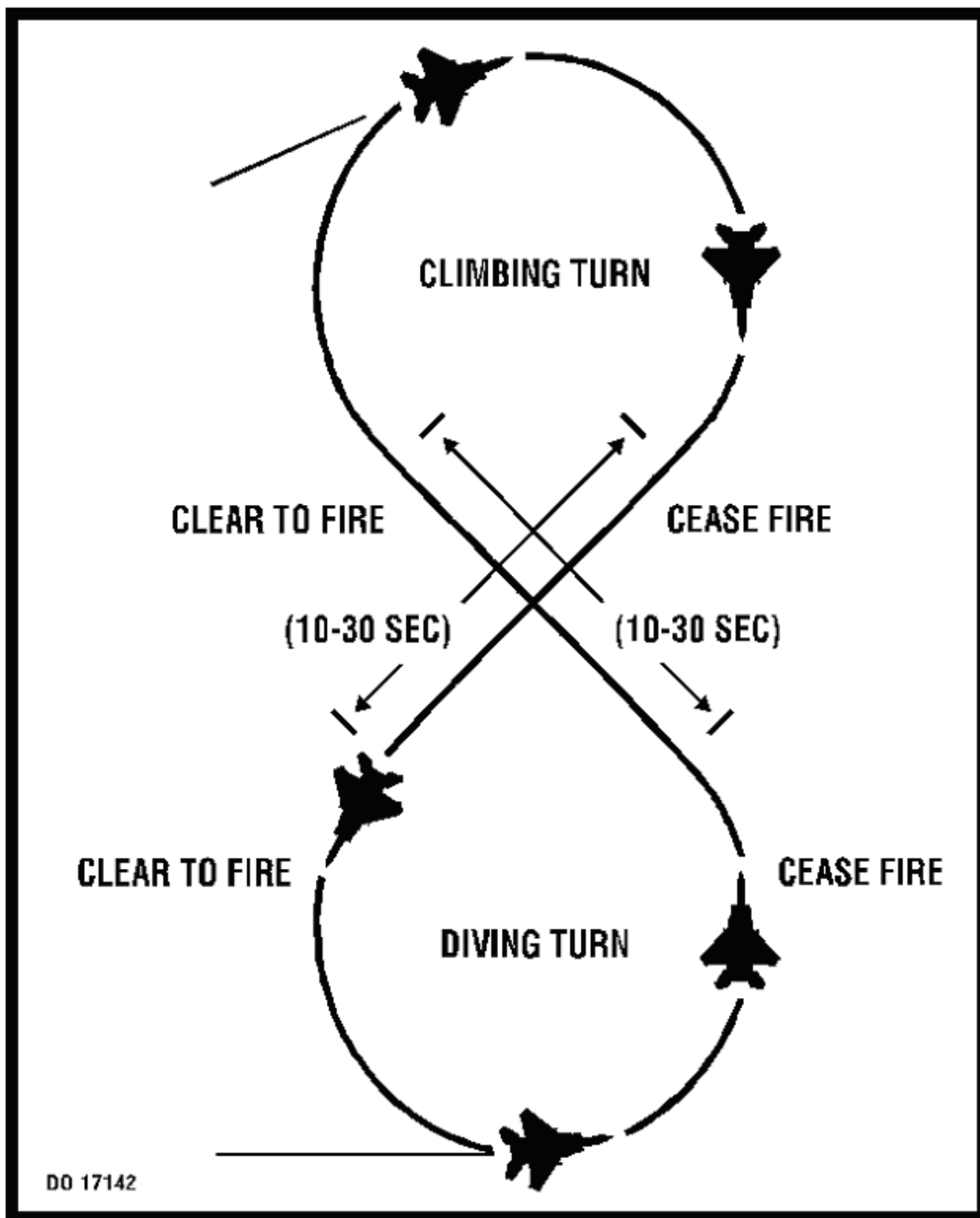


Figure A7.4. Typical "Butterfly" Dart Pattern

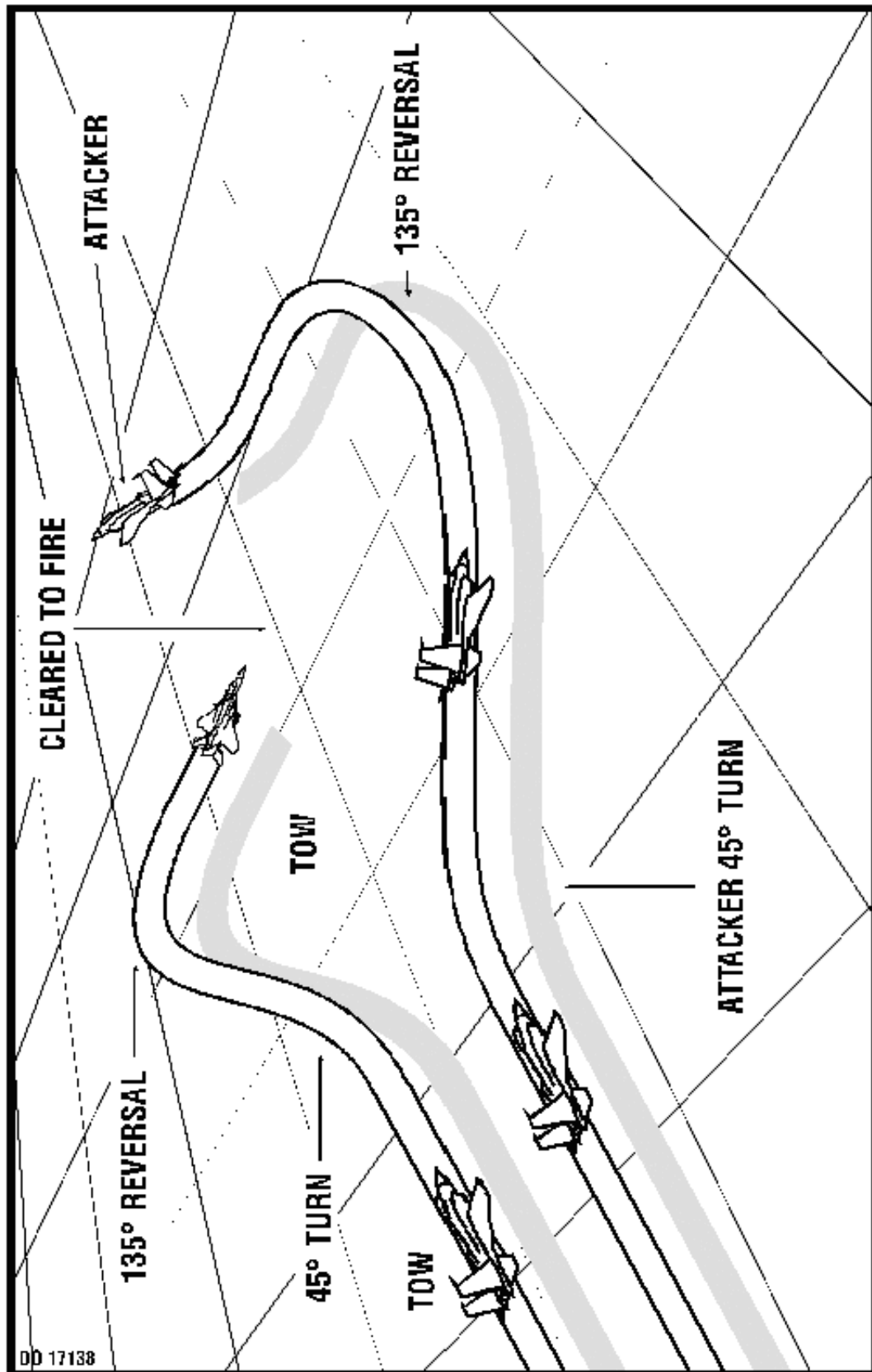


Figure A7.5. Typical "Butterfly" Dart Pattern (2/2).

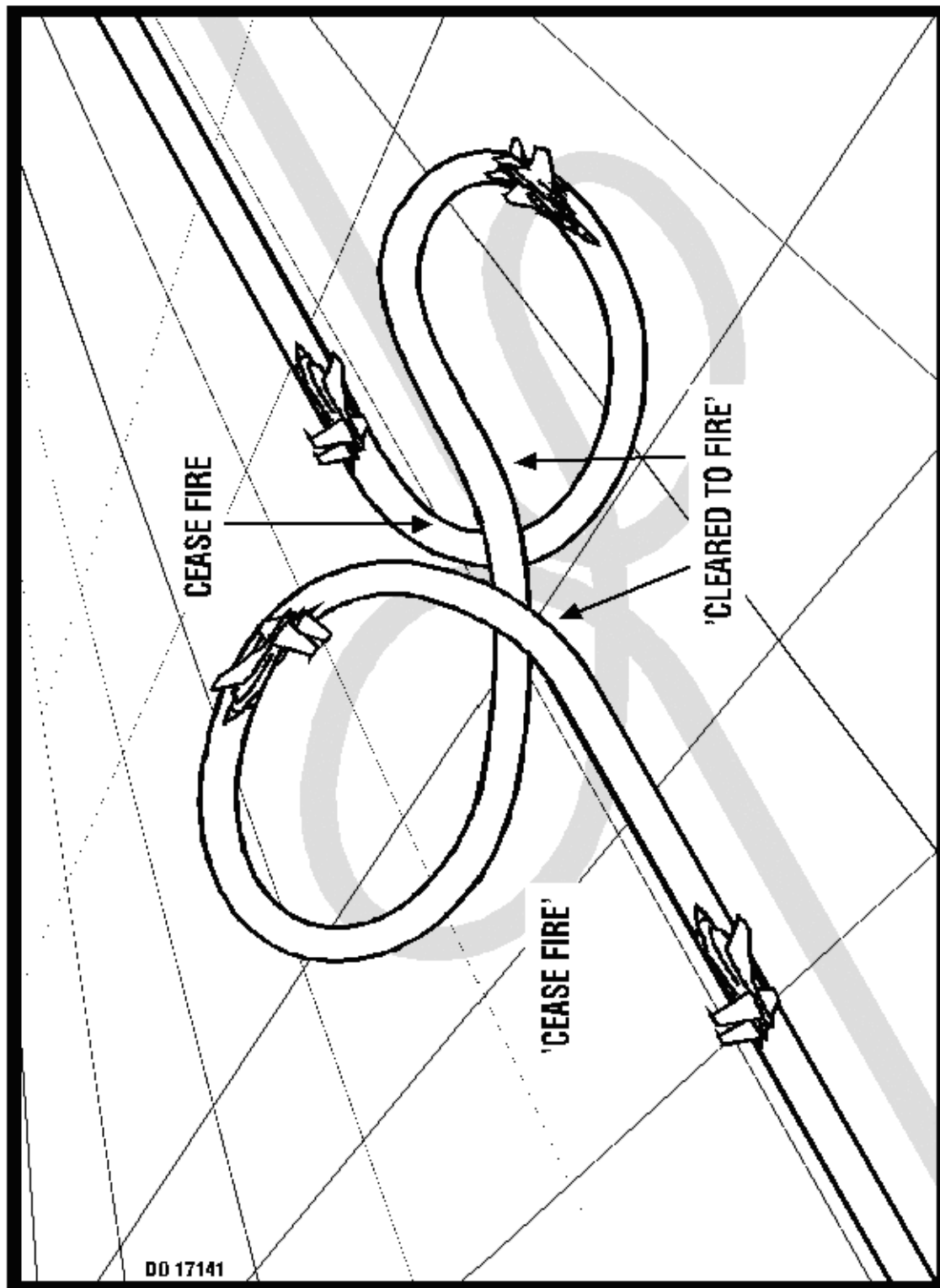
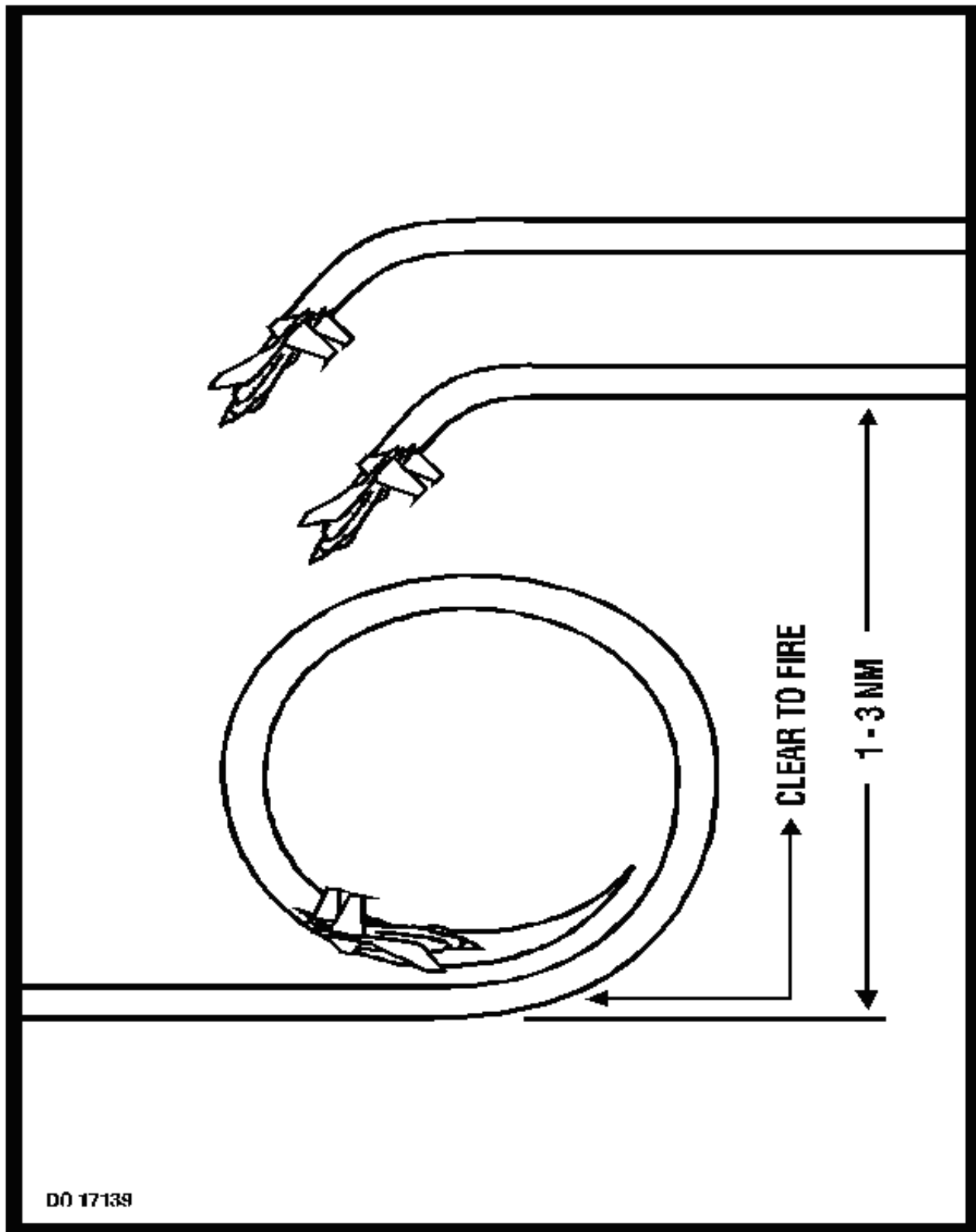


Figure A7.6. Combat Dart Pattern.



**A7.2. Live Missile Firing.** This section applies to live missile firing exercises. Predeployment and deployment briefings will cover specific procedures, requirements, and restrictions.

A7.2.1. Terms Explained:

A7.2.1.1. Range Safety Officer. The Range Safety Officer is the individual responsible for monitoring all parameters of operations safety during live-fire missions. The Range Safety Officer normally operates out of Range Control.

A7.2.1.2. Mission Commander or Safety Chase. An aircrew member qualified to brief and control live missile firing missions. Acts as safety chase for firings.

A7.2.1.3. ABM/WD. A GCI or AWACS director who provides mission support assistance as dictated by the profile.

A7.2.2. General. The TRs of this chapter apply with the following additional restrictions and requirements:

A7.2.2.1. The mission commander will act as safety chase and will brief each aircrew member in detail regarding:

A7.2.2.1.1. Dash-34 Checklist items (ground checks).

A7.2.2.1.2. Pre-range checks.

A7.2.2.1.3. Telemetry procedures.

A7.2.2.1.4. Range procedures.

A7.2.2.1.5. Firing procedures.

A7.2.2.1.6. Launch procedures and parameters.

A7.2.2.1.7. Debris areas and FOD potential.

A7.2.2.1.8. Emergency procedures.

A7.2.2.2. Conduct all missile firings in appropriate Air-to-Air ranges under positive radar control. The mission commander will fly a chase formation position with the firing aircraft (shooter(s)).

A7.2.2.3. Implement procedures to ensure the range is clear of surface activity and other aircraft before firing over an undercast.

A7.2.3. Arming and Dearming. Follow locally established arming and dearming areas for live missile firing missions. Specific procedures for arming and dearming will be in local operating instructions (OIs).

A7.2.4. Firing Procedures:

A7.2.4.1. All members of the flight will clear the range area visually and check for surface activity while in the firing pattern (weather permitting).

A7.2.4.2. Members of the flight not engaged in firing will fly a position as directed by the mission commander. Conduct the flight to preclude any aircraft from entering an area forward of the shooter's 3/9 line when the Master Arm switch is in an armed position. Immediately safe the aircraft missile anytime another aircraft moves forward of the shooter's 3/9 line.

A7.2.4.3. Conduct firings to ensure that both launch, impact, and missile fallout all occur within the range safety footprint.

A7.2.4.4. After firing a missile, the flight will maneuver as necessary to clear possible debris.

A7.2.4.5. Shooters will change positions when cleared by the mission commander.

A7.2.4.6. The mission commander will advise the ABM/WD upon completion of armament safety checks and on clearing the range (if required).

A7.2.4.7. Even if observing a normal missile launch, visually inspect all shooter aircraft with another aircraft to search for damage.

A7.2.5. Communications. Exercise strict radio discipline to alleviate the risk of confusing transmissions. Normally only by the ABM/WD, mission commander, shooter, or range safety officer will make transmissions. This is not to preclude anyone from having knowledge of a dangerous situation transmitting a KIO or other appropriate warnings. Establish voice communications between the firing flight and range control facility before firing. Shooters must acknowledge all directions and be cleared by the range safety officer, through the safety chase, before firing. Along with the radio calls prescribed elsewhere in this regulation, use the following transmissions for Air-to-Air weapons system evaluation program (A/A WSEP) missions:

A7.2.5.1. "COMMIT": Call transmitted by the range safety officer, through GCI, to the shooter to intercept the target. The call allows the safety chase to issue clearance to arm after establishing formation criteria.

A7.2.5.2. "FENCE CHECK": Call transmitted by the safety chase allowing the shooter to arm the weapon system. The shooter will not place the Master Arm switch to ARM until cleared.

A7.2.5.3. "BANDIT, BANDIT": Call transmitted by the range safety officer, through GCI, to transfer range safety responsibility to the safety chase. The safety chase will clear shooters to fire when appropriate.

A7.2.5.4. "CLEARED TO FIRE": Call transmitted by the range safety officer or safety chase to the individual shooters after meeting all safety conditions and accomplishing all mandatory radio calls. This is the only transmission that allows shooters to fire their weapons. Clearance to fire is clearance to arm.

A7.2.5.5. "ARM SAFE": Call transmitted by the safety chase or range control facility. This call cancels clearance to fire. Shooters will safe their weapon system but may continue to engage.

A7.2.5.6. "CEASE FIRE": Call transmitted by the safety chase or range control facility. This call cancels clearance to fire. Shooter may remain armed and continue to maneuver.

A7.2.5.7. "VISUAL BOTH": Call transmitted by the supporting fighter during a two-ship engagement when having a tally on the engaged fighter and the chase aircraft.

A7.2.5.8. "FOX": Call transmitted by the shooter at weapons launch.

A7.2.5.9. "OFF SAFE": Call transmitted by the shooter to indicate coming off the target and safing the weapon system.

A7.2.6. Abnormal Procedures:

A7.2.6.1. If required, missiles will be "safe jettisoned" in the range area according to locally established instructions.

A7.2.6.2. Conduct jettison procedures to ensure both launch and missile fallout occurs within the range boundary.

A7.2.6.3. Hung ordnance and misfire procedures will be according to locally established procedures.

**Attachment 8****AIRCREW AND TERMINAL ATTACK CONTROLLER COORDINATION GUIDE**

(Use for Face-to-Face, Telephonic, or In-Flight Coordination)

***Section A8A—BRIEFING*****A8.1. Participants:**

- A8.1.1. Units (Flying, Ground/Naval, Units Supported)
- A8.1.2. Aircraft Types
- A8.1.3. Call Signs/Mission Number

**A8.2. Weather:**

- A8.2.1. Forecast / Local Observation
- A8.2.2. Sunrise/Sunset/ Moon Illum/Lux data
- A8.2.3. Wx minimums

**A8.3. Working/Training Area:**

- A8.3.1. Times
- A8.3.2. Boundaries
  - A8.3.2.1. Ground references
  - A8.3.2.2. Altitude restrictions
  - A8.3.2.3. Major terrain features
  - A8.3.2.4. Ground Obstructions/Hazards
- A8.3.3. Entry, Exit Points, and Routing
- A8.3.4. CPs, IPs, ACMs, etc.
- A8.3.5. Range Restrictions (noise sensitive areas No Fly areas, etc.)
- A8.3.6. Artillery locations/Friendly air defense artillery locations/Planned ground fire
- A8.3.7. Rotary-wing area(s) of operation

**A8.4. Scenario/SPINS/Comm Plan:**

- A8.4.1. Scenario and Mission Objectives
- A8.4.2. Situation
- A8.4.3. Type ordnance (simulated/practice/live)
- A8.4.4. ROE
- A8.4.5. Comm Plan

- A8.4.5.1. Frequencies/Code words
- A8.4.5.2. Controlling agencies
- A8.4.5.3. Arrival/Working/Departure frequencies
- A8.4.5.4. Mandatory calls
- A8.4.5.5. Joint Tactical Airstrike Request (DD Form 1972) Procedures
- A8.4.6. Surface Threats/Opposing Forces
- A8.4.7. FEBA/FLOT/FSCL
- A8.4.8. Map Datum

**A8.5. General Information:**

- A8.5.1. Ordnance/Weapons Data
  - A8.5.1.1. Type/Fuzing
  - A8.5.1.2. Live Ordnance Procedures/Minimum Altitudes
  - A8.5.1.3. Safe Escape/Safe Separation/Min Safe Distances (for personnel) Fuse Arming/Frag Avoidance
- A8.5.2. Target Marking
  - A8.5.2.1. Type
  - A8.5.2.2. Location/Marker-to-target line
  - A8.5.2.3. Code (s)
  - A8.5.2.4. Friendly marks
- A8.5.3. Switch Changes

**A8.6. FAC/TAC Procedures IAW Joint Publication 3-09.3:**

- A8.6.1. Callsign/Mission #/Terminal controller location
- A8.6.2. Primary/Alternate Target Area
  - A8.6.2.1. Description
  - A8.6.2.2. Frequencies
- A8.6.3. TOT/TTT/Authentication
- A8.6.4. Aircrew/FAC(A) Briefing
  - A8.6.4.1. Identification/mission number
  - A8.6.4.2. Number and type aircraft
  - A8.6.4.3. Position and altitude
  - A8.6.4.4. Playtime
  - A8.6.4.5. Abort Code

**A8.7. CAS Briefing:**

## A8.7.1. Scenario Update

A8.7.1.1. Friendly Positions/Planned Movements

A8.7.1.2. CAS 9-Line Briefing IAW JP3-09.3 (see [Attachment 9](#)).

A8.7.1.3. Additional Restrictions

A8.7.1.4. Hazards

## A8.7.2. CAS Check-In Briefing/CAS Check-Out Briefing (IAW JP3-09.3)

**A8.8. Target Description:**

A8.8.1. Location/Elevation

A8.8.2. Description

A8.8.3. Location of Enemy/Friendly Troops

**A8.9. Attack Tactics:**

A8.9.1. Restrictions

A8.9.2. Axis

A8.9.3. Egress

A8.9.4. Reattack

A8.9.5. Abort Criteria and Procedures

A8.9.5.1. Review “Troops in Contact” and “Danger Close” Calls (peacetime safety criteria will not be compromised)

**A8.10. Training Rules/Objectives:**

A8.10.1. Mission Essential Task Objectives

A8.10.2. Ground Commander’s Training Objectives

**A8.11. Knock-it-off/Terminate Criteria:****A8.12. Contingencies:**

A8.12.1. Alternate Missions/Targets

A8.12.2. Weather

A8.12.3. Emergencies

A8.12.3.1. Hung ordnance/ Accidental/Inadvertent release

A8.12.3.2. Jettison Procedures/areas

A8.12.3.3. Runaway gun

A8.12.3.4. Radio failure/No contact

A8.12.3.5. Controlled Bailout Area

A8.12.3.6. Loss of aircraft

A8.12.3.7. Search and Rescue Procedures

A8.12.3.8. Medevac

***Section A8B—Debriefing***

**A8.13. Accomplishment of Mission/Learning Objectives**

**A8.14. Tactics Used**

**A8.15. Lessons Learned**

## CAS BRIEFING FORM (9-LINE)

**A9.2.** Format: Terminal controller: "\_\_\_\_\_, this is \_\_\_\_\_"  
(aircraft callsign) (terminal controller)

**2. Heading:** " \_\_\_\_\_ " (magnetic heading from IP/BP to target)  
Offset: " \_\_\_\_\_ (left/right)"

**8. Location of friendlies:** " \_\_\_\_\_ " (in cardinal heading and meters, do not give coordinates)

Position marked by: " \_\_\_\_\_ "

**9. Egress:** " \_\_\_\_\_ "

In the event of a beacon bombing request, insert beacon bombing chart line numbers here.

\_\_\_\_\_

**A9.3. Remarks** (As appropriate):" \_\_\_\_\_ "

(threats, restrictions, danger close, attack clearance, SEAD, abort codes, hazards)

**NOTE:** For AC-130 employment, lines 5, 6, and 8 are mandatory briefing items. Remarks should also include detailed threat description, marking method of friendly locations (including magnetic bearing and distance in meters from the friendly position to the target, if available), identifiable ground features, danger close acceptance.

**Time on target (TOT):** " \_\_\_\_\_ " OR

**Time to target (TTT):** "Stand by \_\_\_\_\_ plus \_\_\_\_\_, Hack."

**Attachment 10****IC 2003-2 TO AFI 11-214, AIR OPERATIONS RULES AND PROCEDURES****IC 2003-2 TO AFI 11-214, AIR OPERATIONS RULES AND PROCEDURES****30 SEPTEMBER 2003****SUMMARY OF REVISIONS**

This revision incorporates Interim Change IC 2003-1. This change modifies all 9-Line CAS Briefing Form read back instructions. Recently released (3 Sep 03) JP3-09.3, *Joint Tactics, Techniques, and Procedures for Close Air Support (CAS)* is the governing directive for CAS 9-Line read back procedures.

6.8.1.8. Refer to [Attachment 8](#), and [Attachment 9](#), “Aircrew and Terminal Attack Controller Coordination Guide” and “CAS Briefing Form (9-Line)” when working with Joint Terminal Attack Controller (JTAC).

6.8.2.5. The FAC(A)/TAC will provide the attack aircraft with the 9-Line or theater specific CAS brief. The brief is standardized for use with fixed-wing and rotary-wing aircraft, and is used for all threat conditions and does not dictate the attack aircraft’s tactics. Use of standardized briefing sequence improves mission direction and control by allowing TACs to pass information rapidly. The 9-Line briefing also aids aircrews in determining if they have the information required to perform the attack. The attack flight must read back (verbally or digitally) Line 4 (elevation), Line 6 (coordinates), and any “restrictions” IAW JP3-09.3. The TAC must verbally acknowledge the read-back. CAS briefing and confirmation of friendly/TAC location requirement applies to initial attack brief for each flight. Subsequent attacks by the same flight may not require complete CAS briefing. Coordinate-dependant, autonomously-guided munitions will always require a complete 9-line brief (e.g., JDAM, JSOW, etc.) See paragraph [6.8.3](#) for additional Stand-Off/GPS guided weapons.

6.8.3.2.2. Change to read: Terminal controllers will transmit a complete (9-Line or theater specific) CAS briefing to the attack aircraft (digitally or verbally) on all initial attacks for each flight. Subsequent CAS briefing will be IAW JP3-09.3.

6.8.3.2.3. Aircrews will read back (verbally or digitally) Line 4 (elevation), Line 6 (coordinates), and any “restrictions” IAW JP3-09.3. Terminal controllers may request read back of any items.

6.9.2. JSTARS provides procedural control through airspace lateral and timing deconfliction as reflected in the ACO or delineated real-time tactical control using a complete 9-Line brief with the mandatory read back Line 4 (elevation), Line 6 (coordinates), and any “restrictions” IAW JP3-09.3.

A8.7.1.2. CAS 9-Line Briefing IAW JP3-09.3 (see [Attachment 9](#)).

A9.1. Instructions: Omit data not required, do not transmit line numbers. Units of measure are standard unless otherwise specified. Lines 1-6, and 8 are the minimum essential in limited communications environment. CAS briefing and confirmation of friendly/TAC location requirements apply to initial attack brief for each flight. Subsequent attacks by the same flight may not require complete CAS briefing. Weapons which are coordinate dependant will always require a complete 9-line brief (e.g., JDAM, JSOW, etc.). Aircrew will read back (verbally or digitally) Line 4 (elevation), Line 6 (coordinates), and any “restrictions” IAW JP3-09.3.

**Attachment 11****IC 2003-01 TO AFI 11-214, AIR OPERATIONS RULES AND PROCEDURES**

15 OCTOBER 2003

**SUMMARY OF REVISIONS**

This revision incorporates Interim Change IC 2003-1. This interim change clarifies separation of T/AT-38 aircraft during execution of G-awareness exercises (paragraph 3.2.1.). It deletes the discernible horizon requirement for LIMITED maneuvering (paragraph 5.2.7.2.1.). It adds a statement allowing aircraft to perform stern conversions against a non-maneuvering target in meteorological conditions that otherwise mandate restricted or non-maneuvering intercepts (paragraph 5.2.7.3. and 5.2.7.4.). It also deletes weather restrictions for restricted maneuvering categories for fixed wing aircraft (paragraph 5.2.7.3.1.).

3.2.1. The following will completely replace paragraph 3.2.1.: G-Awareness Exercise. Fly G-awareness exercise in airspace that is free from potential conflict. Flight members will maintain a minimum of 6000' between aircraft (4000' between T/AT-38), during the execution of all G-awareness exercises. Fly G-awareness exercises for the following circumstances.

5.2.7.2.1. The following will completely replace paragraph 5.2.7.2.1. Weather Requirements: 2,000 feet vertical and 1 nm horizontal cloud clearance, 5 nm (8 km USAFE) visibility.

5.2.7.3. The following will completely replace paragraph 5.2.7.3.: RESTRICTED. Provides for Air-to-Air training with heading changes of up to 60 degrees either side of course. This does not apply to aircraft performing stern conversions versus RESTRICTED maneuvering targets.

5.2.7.3.1. DELETED

5.2.7.4. The following will completely replace paragraph 5.2.7.4.: NON-MANEUVERING. Provides for Air-to-Air training by maintaining constant heading, airspeed, and altitude. This does not apply to aircraft performing stern conversions versus NON-MANEUVERING targets.